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Steinbach,
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Evaluating the Consequences of Public Land Grazing Permit Buyout Program, Permit Reductions, and Increased Fees on Land Ownership and Open Space in Western States

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Final Report

Evaluating the Consequences of Public Land Grazing Permit Buyout Program, Permit Reductions, and Increased Fees on Land Ownership and Open Space in Western States

Prepared for

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Mark Steinbach

Jack Ward Thomas

College of Forestry and Conservation

University of Montana

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240 W Prospect Rd
Fort Collins CO 80526

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Executive Summary

Objectives

1. Provide and analyze sociodemographic profiles for landowners with public land grazing permits.

2. Evaluate permittees' knowledge, likelihood of participation, and motivation for involvement in a grazing permit buyout program.

3. Describe possible trends and consequences of implementing the proposed grazing buyout program relative to impacts on agency management, ecological consequences, and examination of potential costs of the program.

Scope and Purpose

This report is the product of a research agreement between The University of Montana and the USDI Bureau of Land Management (agreement #ESA990004) and the USDA Forest Service (agreement #03-CS-11221600-275). Our primary focus was assessment of likely participation levels, potential costs, and search for unforeseen consequences related to the proposed buyout program. We found that the proposed buyout program may be inadvertently detrimental to overall ecosystem health and have unintended economic, ecological, and cultural consequences for the administering agencies and grazing permittees. Data collected from a mail survey sent to 2000 permittees in the Rocky Mountain states (39% response rate), and 49 personal interviews (33 ranchers, 16 agency personnel) enabled us to describe likely outcomes and previously unmentioned items for consideration related to the proposed buyout program.

Principal Findings

- Based on data collected from the mail-survey
    - 17% of respondents indicated they would consider selling their permit at $175/AUM, although follow up interviews indicated the actual figure may be closer to 10%.
    - The average acceptable buyout amount per AUM for willing permit sellers was $340, and $500 for non-willing sellers (compared to the proposed rate of $175/AUM).

- Of those who would consider selling, 54% have already seriously considered selling their private property.
- By a slight majority, those who would sell their permit indicated they are more interested in subdivision and sale of their private land compared to non-willing sellers.

- Additional analysis of small, medium, & large ranching operations and full-time & part-time ranchers yielded other notable results
  - Large (>2000 ac) & mid size (500-2000 ac) private landowners are more inclined to sell their property if they sell their permit than smaller landowners.
  - Additionally these two groups (>2000 ac & 500-2000 ac) have already sold and/or intend to sell their property more than were smaller landowners.
  - Comparing part-time and full-time ranchers, part-timers felt that the buyout program was a good idea, although most would not sell their land.
  - Likewise, the full-time group is more likely to sell their land as a result of increases in grazing fees and/or reductions in permitted livestock numbers, and indicated they would be more inclined to sell their land if these changes occur.
- Based on information gathered from face-to-face interviews we were able to discern motivations for participation in a buyout program, some concerns, and suggestions for improvements in the proposed buyout program.
  - Reasons for participation in a buyout
    - Agency influences – ESA compliance & poor relationships with federal personnel
    - Retirement
    - Debt/money problems
    - Conflict with recreational users
    - Uncertainty relative to the future of the grazing program
  - Ecological concerns
    - Increased fragmentation of private land into smaller parcels

        - Loss of winter range for deer and elk
        - Decreased number of water sources for wildlife on public land
    - Administrative concerns
        - Fire risk in the wildland/urban interface duel to fuel accumulation
        - Maintenance of developed water sources on allotments
        - Fencing responsibility
        - Management of livestock and associated infrastructure on common allotments (i.e., allotments where two or more permittees run livestock)
        - Management of inholdings
    - Local community concerns
        - Lifestyle loss
        - Community impacts
        - Loss of state grazing lands revenue
        - Financial issues – tax base
    - Suggested program improvements
        - Increased flexibility of range management at the local levels (forest or field office), as "one size does not fit all" appropriately
        - Land exchanges for individuals with inholdings or irregular property boundaries
        - Phase out period for removal from allotments
        - Increase the buyout amount to more realistic level
        - Split buyout fee, with part going to protection of associated private lands (purchase of easements to maintain open space)
        - Use of "retired allotments" in grassbanks

Issue Synopsis

The participation rate will likely not exceed 20% at the program's inception. If the 17% of permittees who indicated they would participate in a buyout at the currently proposed $175/AUM, the cost to purchase the AUMs alone would be over $500 million. However, we estimate the additional infrastructure and management costs associated with

dealing with secondary consequences will likely add $50/AUM , raising the cost to over $650 million, for a 17% participation rate. Furthermore, these estimates only deal with direct costs which would be incurred by the agencies. No estimates were made for almost certain additional costs such as conducting new EISs for land-use planning, ecological problems, cultural adjustments, economic consequences to associated communities, and impacts on management of associated private lands.

Principal Recommendations & Conclusions

Prior to formulating environmental and economic policy, it is crucial to understand and rationally evaluate likely outcomes in terms of costs and benefits for ensuing landscapes and communities. With that in mind, several factors emerged from our analyses which should be addressed prior to implementing a full-scale buyout program.

- Update permittee list and associated databases – the current list has numerous errors and inaccuracies.
- Provide a full accounting of pertinent factors – number of permittees, and extant associated infrastructure (water, fences, gates, etc.).
- Improve acceptance of buyout – if the buyout program is to succeed, an information campaign will need to be developed to improve the understanding, image, and acceptance of the buyout to permittees.
- Region specific management - develop more specific grazing guidelines and flexibility for regions.
- Region specific grazing fees – this works in conjunction with region specific management based on forage quality.
- Redraft of legislation – workshops of permittees, agency personnel, and buyout proponents to fully discuss ramifications of such legislation and improve the purpose.

- Trial Basis Program – trying this program in localized areas with the highest potential to achieve ecological success would help to gauge the effectiveness and provide guidance for improved application.

Problem Statement and Justification

Public land grazing policies in the United States are under scrutiny by various interest groups for a variety of reasons including impacts of livestock grazing on "ecosystem health". In addition, some groups argue that permits for grazing on public lands are subsidies to permit holders because of the relatively low cost of grazing permits (Wuerthner and Matteson 2002, NPLGC 2004c), compared to fees charged for grazing on ecologically similar private lands (Quigley and Thomas 1989). Critics have argued for increased permit fees comparable to those charged on similar private lands (Moskowitz and Romaniello 2002). Other have expressed grievances and concerns relative to adverse environmental effects of public land grazing (Wuerthner and Matteson 2002). Their wish is to see public lands used strictly for recreational purposes, wildlife habitat, enhanced environmental conditions, and aesthetic values (Gentner and Tanaka 2002).

A recently proposed policy change concerns creation of an opportunity for permit holders to sell their grazing permits to the federal government in order to permanently retire lands from livestock grazing to improve range health. The proposed buyout program would provide compensation at the rate of $175 per animal unit month (AUM)[1] to willing sellers, and permanently retire the associated permits (NPLGC 2004d). Grazing permits numbers are determined based on the available forage for livestock and amount of livestock that can be grazed as determined by the number of AUMs available (Egan and Watts 1998).

[1] An AUM is the amount of forage consumed in one month by one animal unit (AU) and serves as a basis to calculate the number of animals that can be grazed on an area. One AU equals the live weight of one cow, or 455 kg, under the assumption that animals at this weight consume a constant amount of forage (Holechek et al. 2004).

In contrast, if the buyout program were enacted, it clearly implies that a property right exists which landowners can sell. This recognition of a property right is contradictory to the Taylor Grazing Act which states, "the creation of a grazing district or the issuance of a permit pursuant to the provisions of this subchapter shall not create any right, title, interest, or estate in or to the lands (U.S.C. § 315 1934)." If a property right is, unintentionally or intentionally, established through a buyout program, it could be argued that a "taking without compensation" had occurred for those permittees who lost their permits or had permitted number of AUMs reduced though government action at anytime in the past. Answering these legal questions is beyond the scope of this research effort but will need additional study. Further, buyout proponents have not considered the inherent ecological, sociological, and economic ramifications of such a program. Such questions should be thoroughly explored before the formation of any such buyout program.

This study examines likely outcomes of the proposed permit buyout program and implications of increased fees or permit reductions as they relate to likely actions of involved private landowners. A scenario of decreased profitability of ranching operations related to permit loss seems likely to have similar impacts to those of a buyout program if permittees substantially reduce herd size or face fee increases for animals grazed on public lands. Some have claimed that the proposed buyout program is favored by many ranchers and would be well received (NPLGC 2003a, NPLGC 2003b).Yet, no studies have been published that pertain specifically to ranchers' responses to the buyout program, and these studies (Martin 1966, Nielsen 1972, Torell et al. 1981, Lambert 1987, Gentner 1999, Bartlett et al. 2002) that have evaluated the consequences of fee increases

and herd reductions do not specifically address what might happen to associated private lands as a result.

Purpose and Objectives

Another concern that has arisen relative to proposed buyouts is the potential for such a program to accelerate ongoing loss and ongoing fragmentation[2] of "open space." Would a proposed buyout program entice economically stressed ranchers to take the buyout and, then, sell their land (base property)[3] due to a combination of increasing market values of their base property for subdivision and resultant decreased economic viability of associated ranching operations.

Although public benefits produced by open space are recognized as substantive (Parks and Schorr 1997, Bolitzer and Netusil 2000, Geoghegan 2002), such values are, for the most part, subjective and difficult to evaluate, as they are influenced by interactions of geographic region, cultural ideals, wildlife values and other factors. The issue of fragmentation of private land ownerships into smaller parcels is complicated due to the location of many of these properties adjacent to, or nearby, the public lands associated with their grazing allotments.

We wanted to determine if grazing permits have a previously unaddressed, unrecognized, and unappreciated public value aside from producing income to ranchers. We hypothesized that the proposed buyout program might, inadvertently, be detrimental to overall ecosystem health and integrity of western landscapes by increasing

[2] Fragmentation is what occurs when native environments (rangeland, old-growth forest, coastal scrub) are transformed or divided into areas for human use (i.e. roads, housing developments).
[3] Base property is private land required for qualification to lease public land for grazing, with the intent being for permittees to have sufficient forage and water to enable his stock to move off public range for a portion of the year for rest

fragmentation of associated private lands many of which are adjacent to relatively contiguous blocks of public lands.

Similar results might occur from increased grazing fees or reduced livestock numbers or some combination thereof. However, these simple hypotheses are only several of the potential problems that might be associated with the proposed buyout program that should be addressed prior to enactment. Other unanticipated consequences involve issues related to water rights, responsibility for fencing, agency responsibility for resulting new complications in land management, human communities, tax ramifications, and adverse effects on some wildlife.

Obviously, proposals to "buyout" grazing permits and/or increase fees for grazing and/or reduce permitted numbers of livestock all have likely ramifications that have not been explored or revealed or both. We asked and answered, a series of "what if" questions that emerged from ongoing debates relative to public grazing polices and associated with proposed buyouts of permits. If the government implemented a buyout program, increased fees, or reduced the number of AUMs – what might be some of the economical and ecological effects? What are some of the likely scenarios relative to some or all involved base properties? What are other factors that should be explored and answered prior to proceeding with such a dramatic shift in policy relative to livestock grazing on public lands?

Our objectives were to:

4. Provide and analyze sociodemographic profiles for landowners with public land grazing permits.

5. Evaluate permittees' knowledge, likelihood of participation, and motivation for involvement in a grazing permit buyout program.

6. Describe possible trends and consequences of implementing the proposed grazing buyout program relative to impacts on agency management, ecological consequences, and examination of potential costs of the program.

Survey Methods

A list of all landowners (21, 448) who own private land and have public grazing permits was obtained from the USDA Forest Service (FS) and Bureau of Land Management (BLM) in the seven-state[4] study area as a result of request under the Freedom of Information Act (FOIA). These lists included permittees' names, addresses, number of AUMs, and the respective agency field office administering the permit. No sociodemographic data relative to these permittees was obtained from this list. The final list included 10,787 BLM and 3,480 FS permittees (total of 14,267). Two thousand surveys were sent to randomly selected permittees, 1000 from each agency permittee list. A total of 880 surveys were returned, of which 704 were useable, 176 were non-usable[5] leaving a population of 1,824. The response rate was 39% (704/1824).

A "random non-response bias test" was conducted on 125 individuals that did not return a survey (Chen 1996). This sample of individuals was contacted by phone. Seventy-six non-respondents were successfully contacted, and 44 cooperated with the non-response test. Those 44 indicated that they were "too busy" to fill out the survey, and the data collected from them at this later date revealed little difference from the data collected with the survey. The 27 individuals who would not participate commented that they perceived the project as part of some "environmental" program or stated they did not have time to participate.

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[4] Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming

[5] The 176 non-useable responses included listed permittees which were decreased, had wrong addresses, or no longer held the permit.

Survey Results

We analyzed the survey data based on respondents property size (Appendix A), and engagement in ranching activities (Appendix B). In addition, data were analyzed using insights from previous related research efforts which identified specific categories of ranchers based on demographics and attitudes using cluster analysis techniques (Bartlett et al. 1989, Birkenfeld 1994, Bernhardt et al. 1996, Gentner 1999, Gentner and Tanaka 2002). Similar categories to those used by these investigators were developed and analyzed with descriptive statistics to identify themes concerning ranching within and between individual groups. Using this technique provided profiles by which to classify operators demographically, by land tenure characteristics, and reactions to key policy initiatives (Appendix C).

Willingness to participate in the grazing permit buyout program was analyzed to provide insight for motivations to sell permits and what likely scenarios might unfold. Accordingly, we assessed differences between individuals who were willing to participate in the program and those who were not. These two groups were examined using an analysis of variance (ANOVA) comparing demographic characteristics, motivations for owning land, potential reactions to grazing buyout polices, reactions to increased fees, reactions to herd reductions, land sale characteristics, and environmental behaviors.

The ANOVA revealed significant differences between groups relative to number of animal units in the ranching enterprise, age, education, total income, and percent income derived from off-ranch jobs (Table 1). The average number of AUMs was higher

for willing sellers which possibly indicated that those who stood to gain more from such action would be more likely to participate. Age was significantly lower for willing sellers, perhaps indicating a younger generation less enamored of the ranching business. Education was significantly higher for willing sellers, although the mean indicated some level of college or vocational school education. Finally, the percent of income from off-ranch jobs was significantly higher for willing sellers, indicating less dependence on ranch income and, therefore, grazing permits.

Table 1. Differences among permit sellers and non-permit sellers related to demographics, means and standard errors

Category Variable	Would Not Sell Permit	Would Sell Permit	F^a
N	582	122	
Acreage Owned (ac)	1376 (111.4)	1199 (245.4)	0.54
Range (ac)	12-173,000	10-330,000	
Total AUM's	119 (7.3)	191 (23.4)	11.98***
Length of Tenure (years)	22.6 (1)	19.2 (2.1)	2.47
Demographics			
Age	59.1 (0.6)	55.7 (1)	7.07**
Education	3.24 (0.1)	3.48 (0.1)	4.21*
Percent Income - Off - Ranch	19.65% (1.3)	26.36% (2.9)	4.79*
[a] *p<.05, **p<.01, ***p<.001			

Although, these two groups differed little demographically, there were distinct differences between motivation for owning land and opinions relative to the proposed buyout program (Chart 1). Most remarkable was the difference between the two groups based on their motivations for owning land as related to developing land commercially. This variable did not prove significant in any other analysis, and showed that those who are willing to sell their permit already have an inclination to sell their private land for developmental purposes given appropriate circumstances. Likewise, most variables related to the buyout program proved significant. One of the most revealing variables was the acceptable buyout rate. In this analysis, willing sellers would accept substantially less

money per AUM (approx $340) than non-sellers (approx $500) indicating that they were truly interested in participating. However, the $340 amount they selected as a minimum price was double the proposed amount of $175/AUM.

Only one variable from the questions related to land sale and conservation questions was significant (Chart 2). Although permit sellers had sold only slightly more property in the past 20 years (29%), than non-sellers (24%) the stark difference was related to willingness to sell property (Chart 2). Fifty-four percent of willing permit sellers had seriously considered selling land prior to any proposed buyout, over non-willing permit sellers (35%). Their responses indicated that a large portion of willing sellers may well be looking for opportunities to get out of the ranching business. If so, it seems likely that many who would participate would sell out and leave ranching even if there were no buyout. In those cases the buyout would simply accelerate what would happen anyway. If the goal is to retire permits, then setting a policy whereby the permit of such operations were simply "retired" would achieve the same goal without the additional costs.

We evaluated the likely impact of fee increases and/or herd reductions related to willing permit sellers and non-sellers. Respondents could choose from one of four possible actions (keep using permit, ranch without permit, quit ranching but keep land, and quit ranching and sell land). Given concerns about land sale and private property land fragmentation, we created three responses by collapsing the 2nd and 3rd response into a "keep land- but not permit" variable. This analysis revealed no significant differences for fee increases or herd reductions when compared to participants' reactions to the buyout program, although permit sellers are more inclined to sell their land as price increases and

herd numbers decrease. To provide a better overall impact of fee increases and herd reductions all respondents were pooled into a single group (Chart 3 & 4). Overall most respondents were willing to keep their permit with up to a $4 increase or 25% herd decrease. At slightly over $6 and a 50% reduction, the number of people who give up their permit exceeds the number who are willing to keep it.

Chart 1. Reasons for owning land and reactions to buyout programs related to willingness to sell permit.

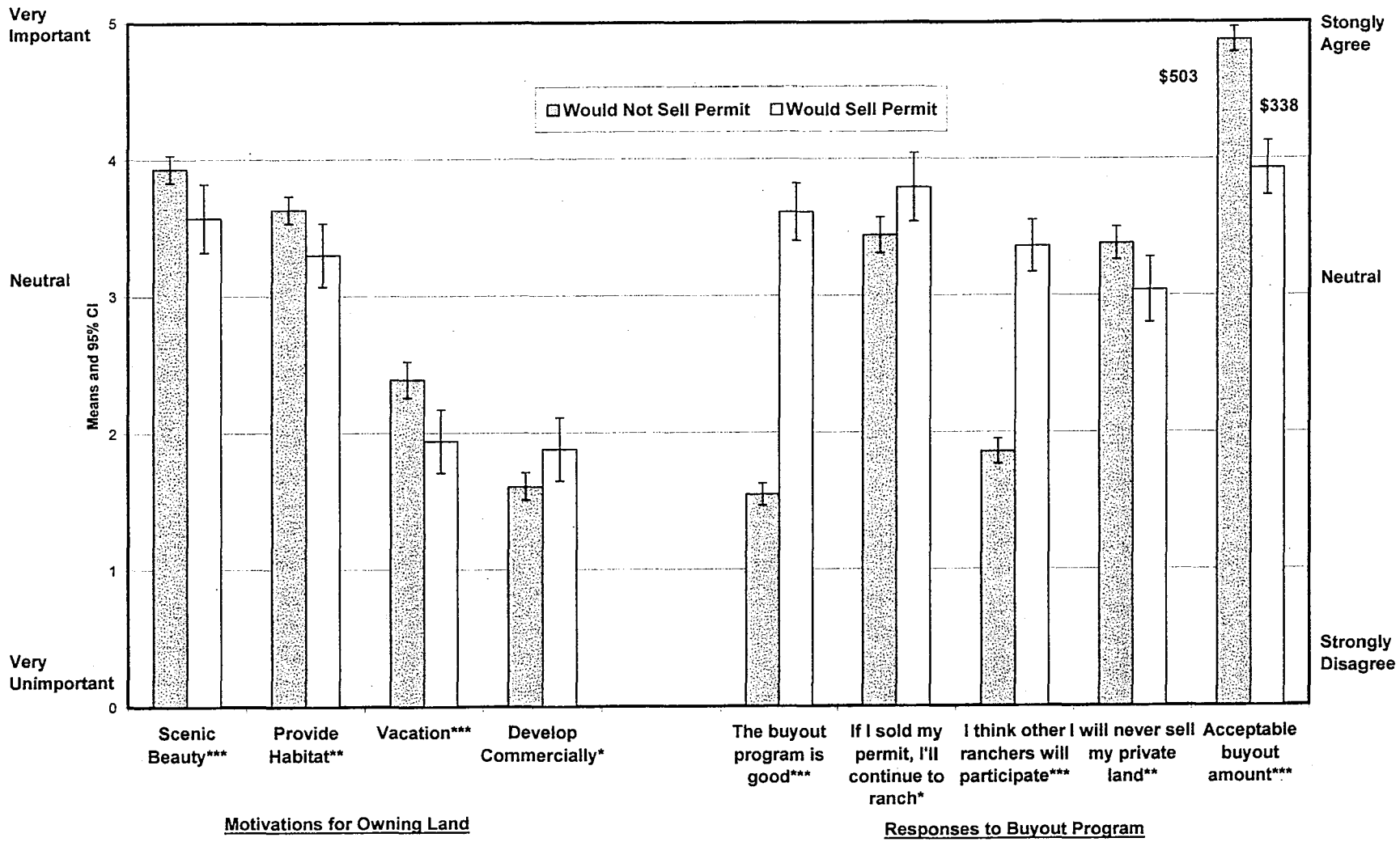
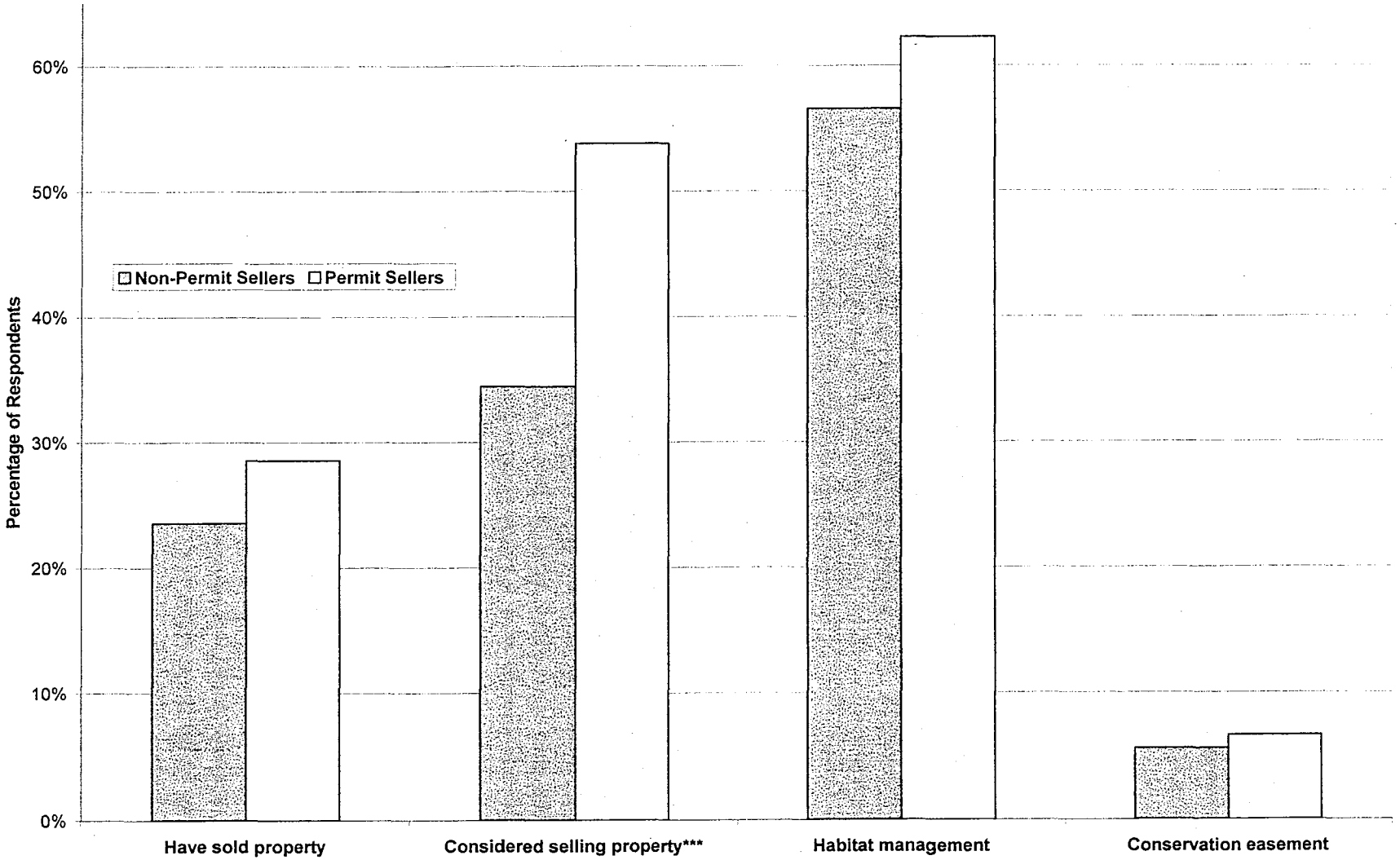


Chart 2. Land sale and conservation behaviors related to willingness to sell permit



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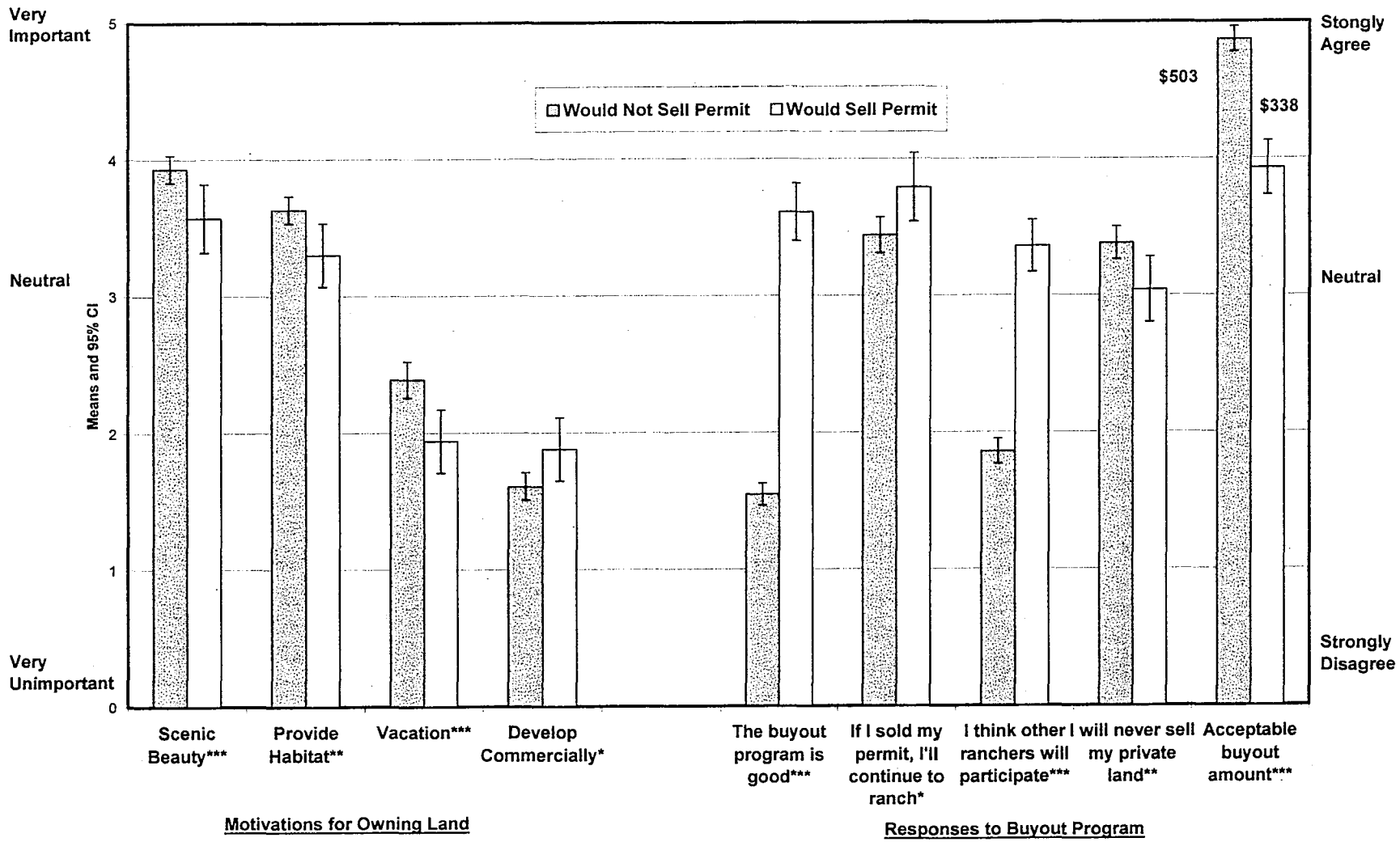

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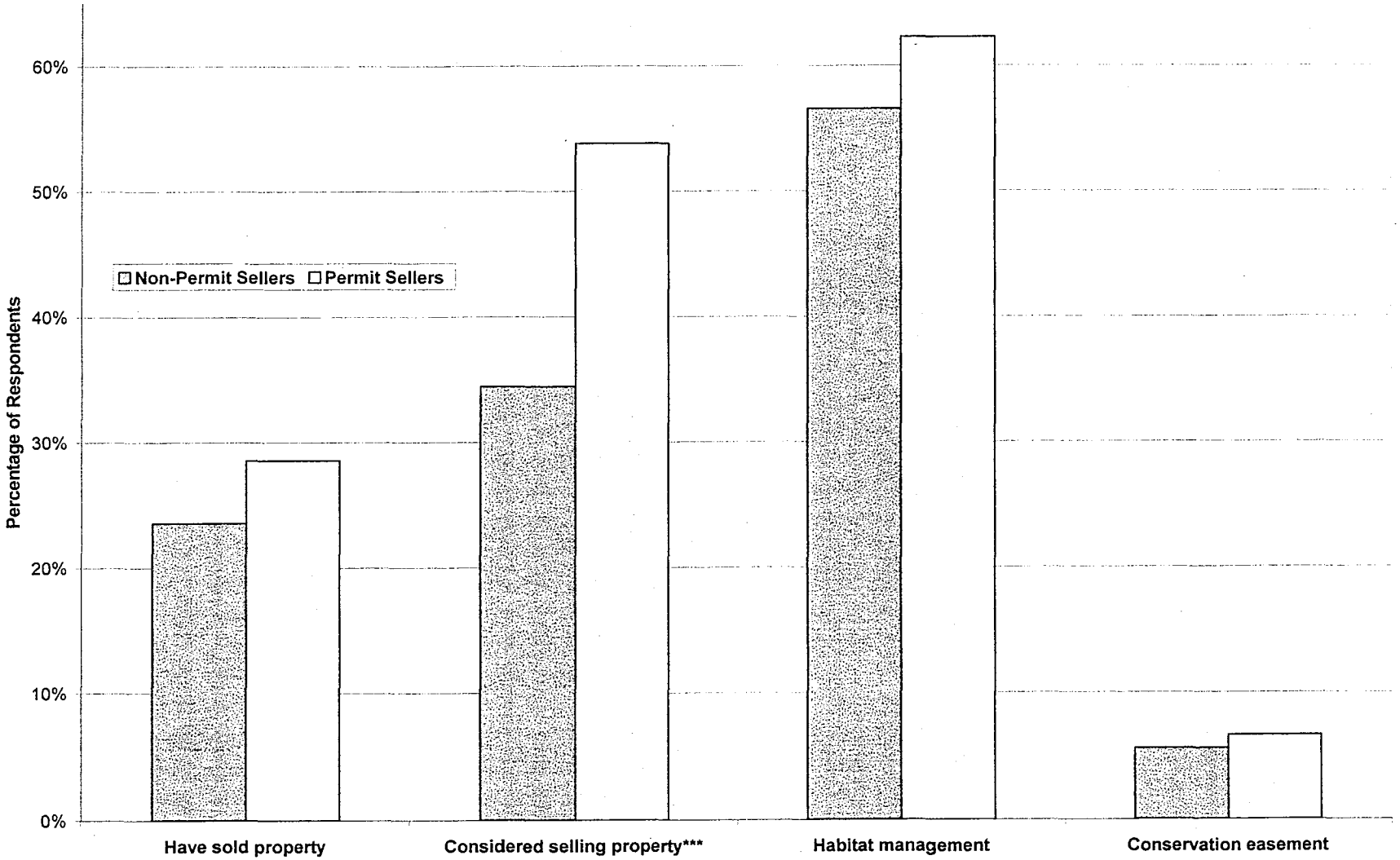
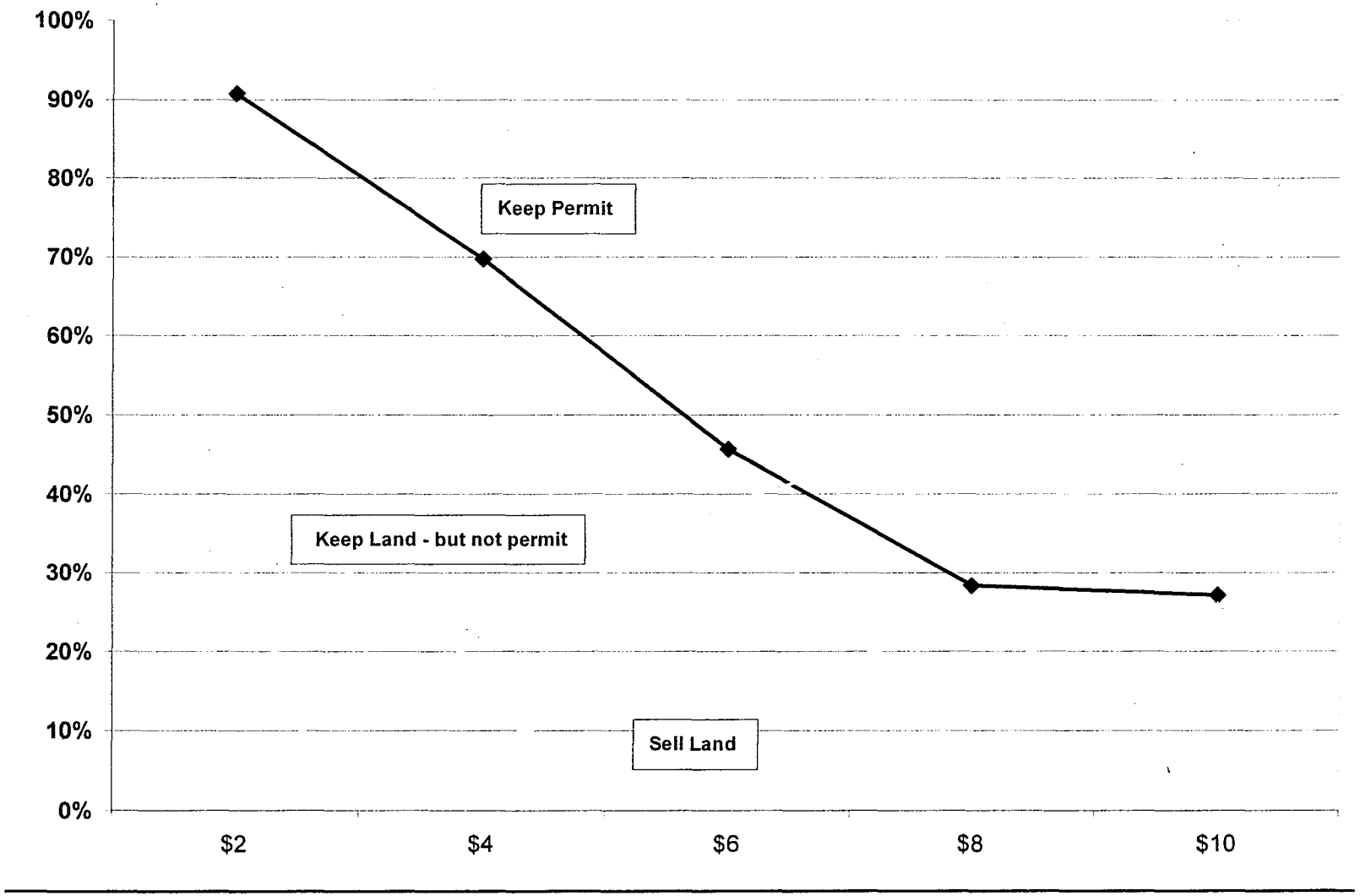


Chart 3. Reactions to increased fees for all respondents



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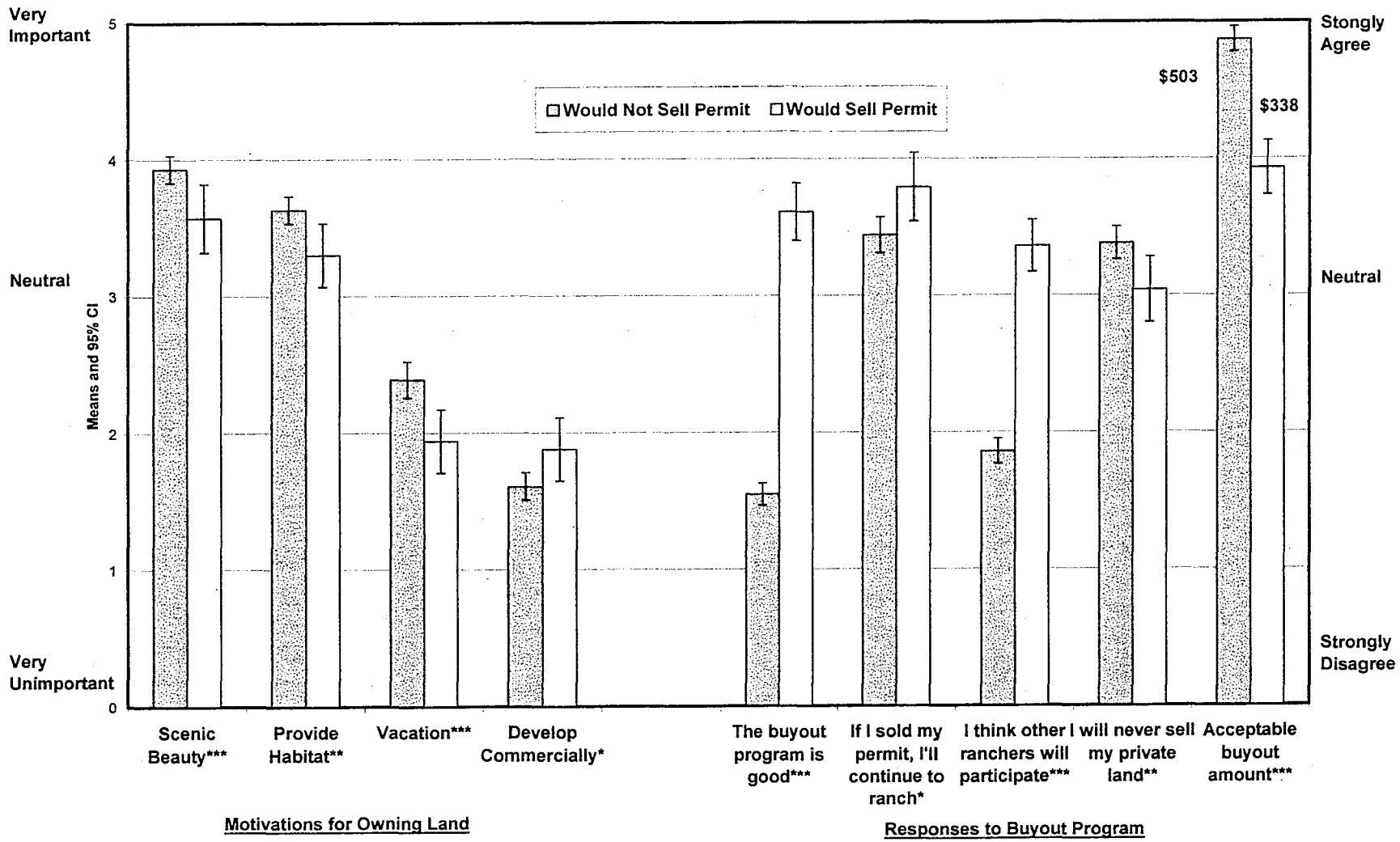

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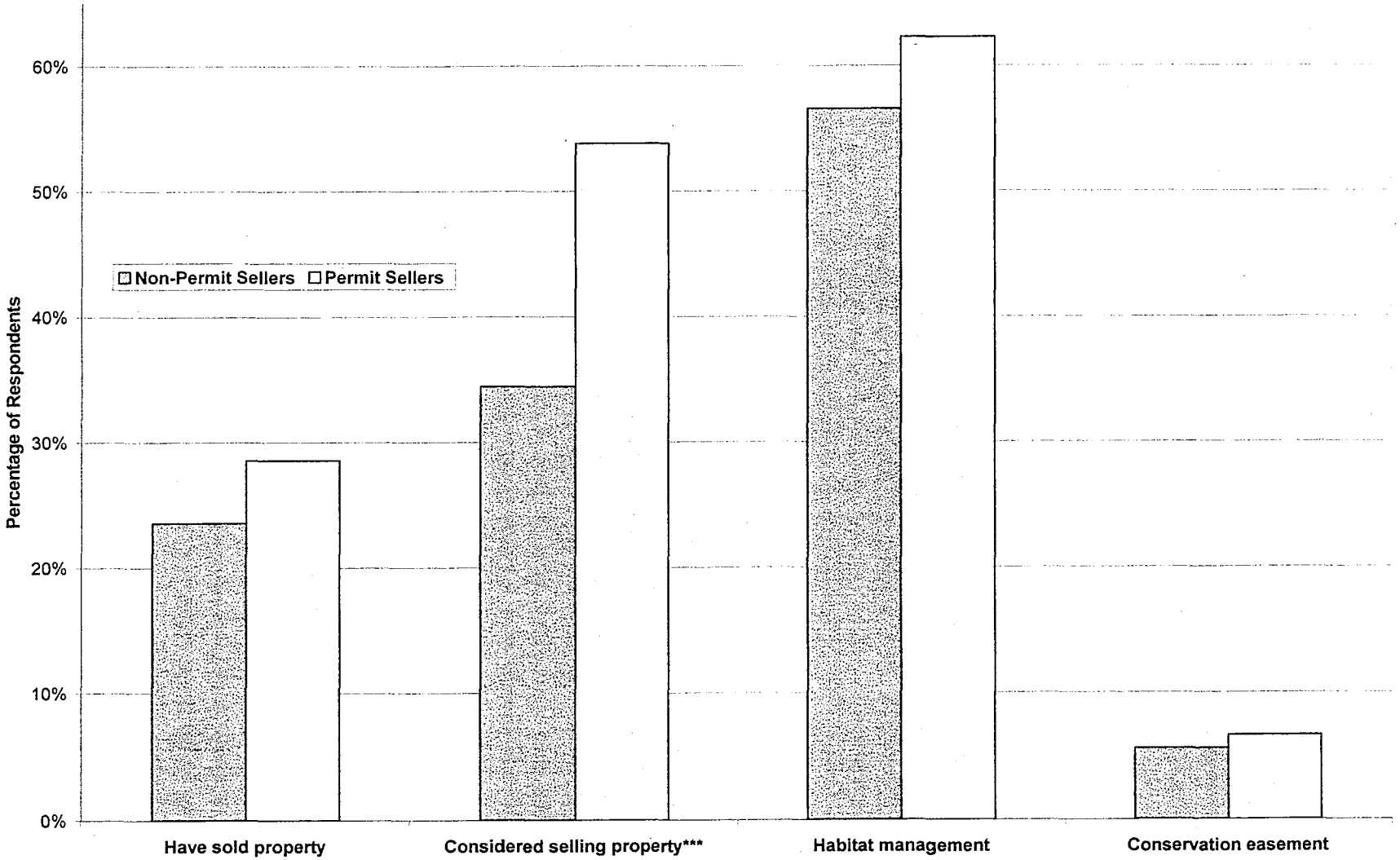

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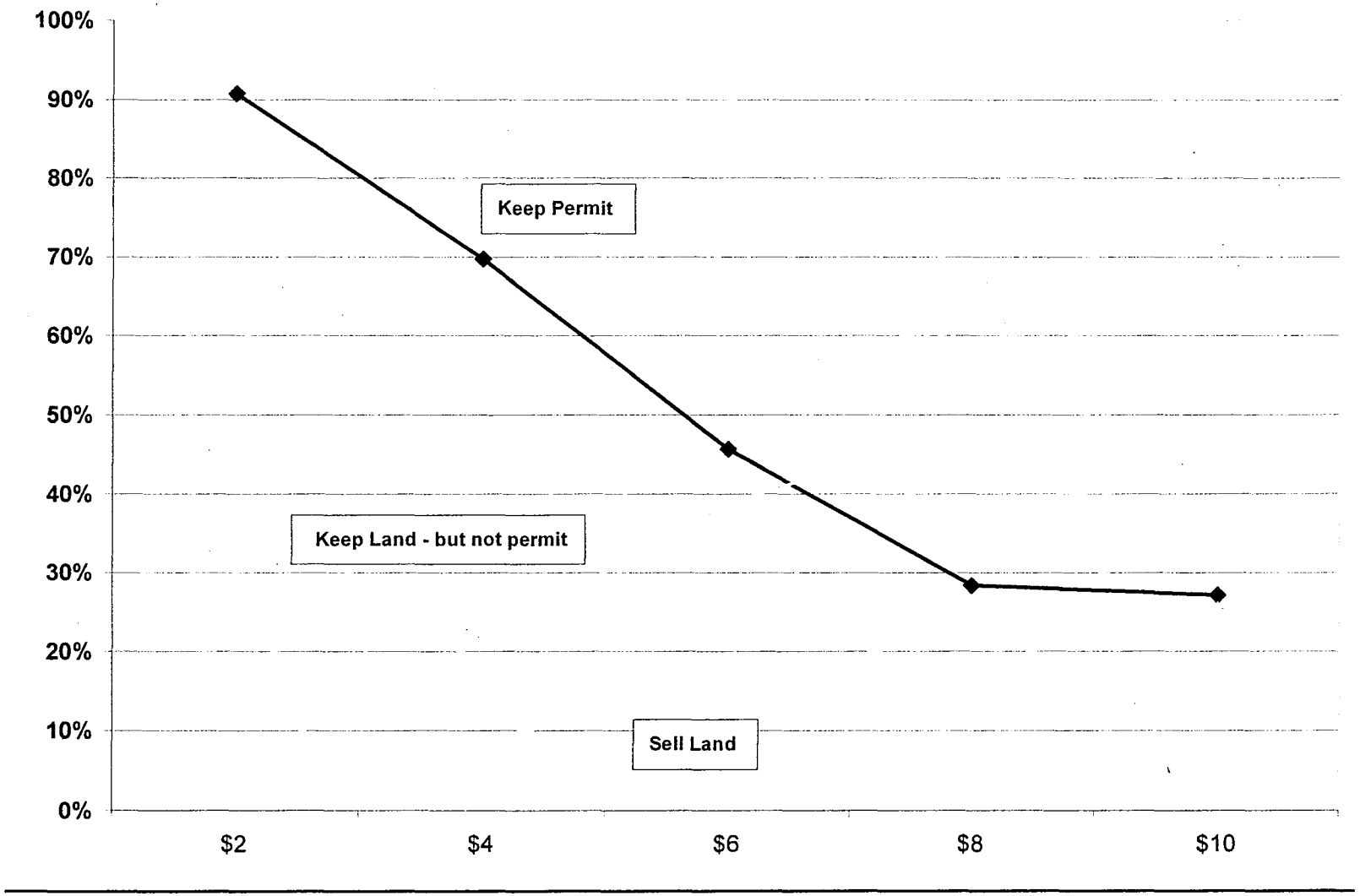

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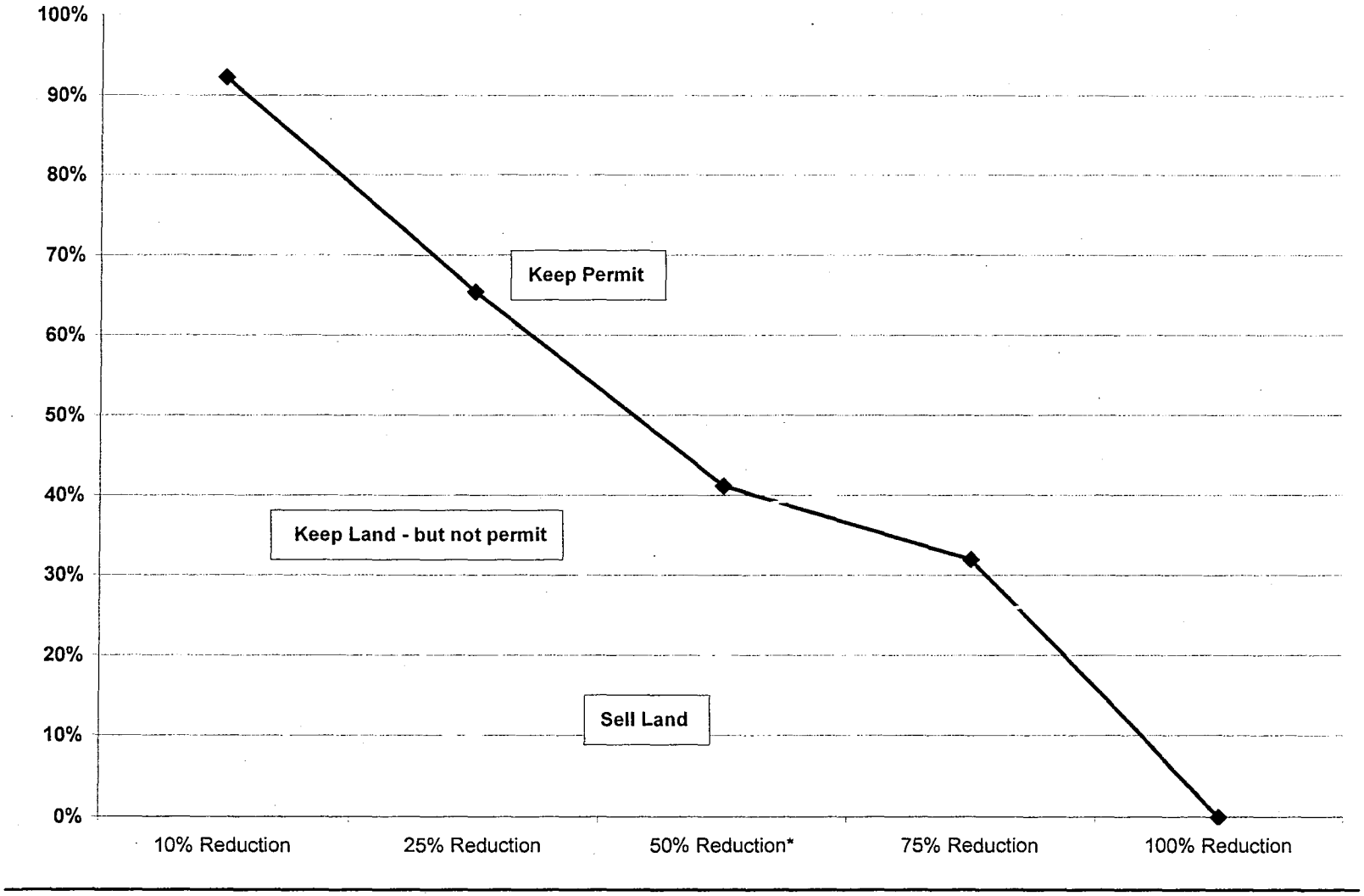

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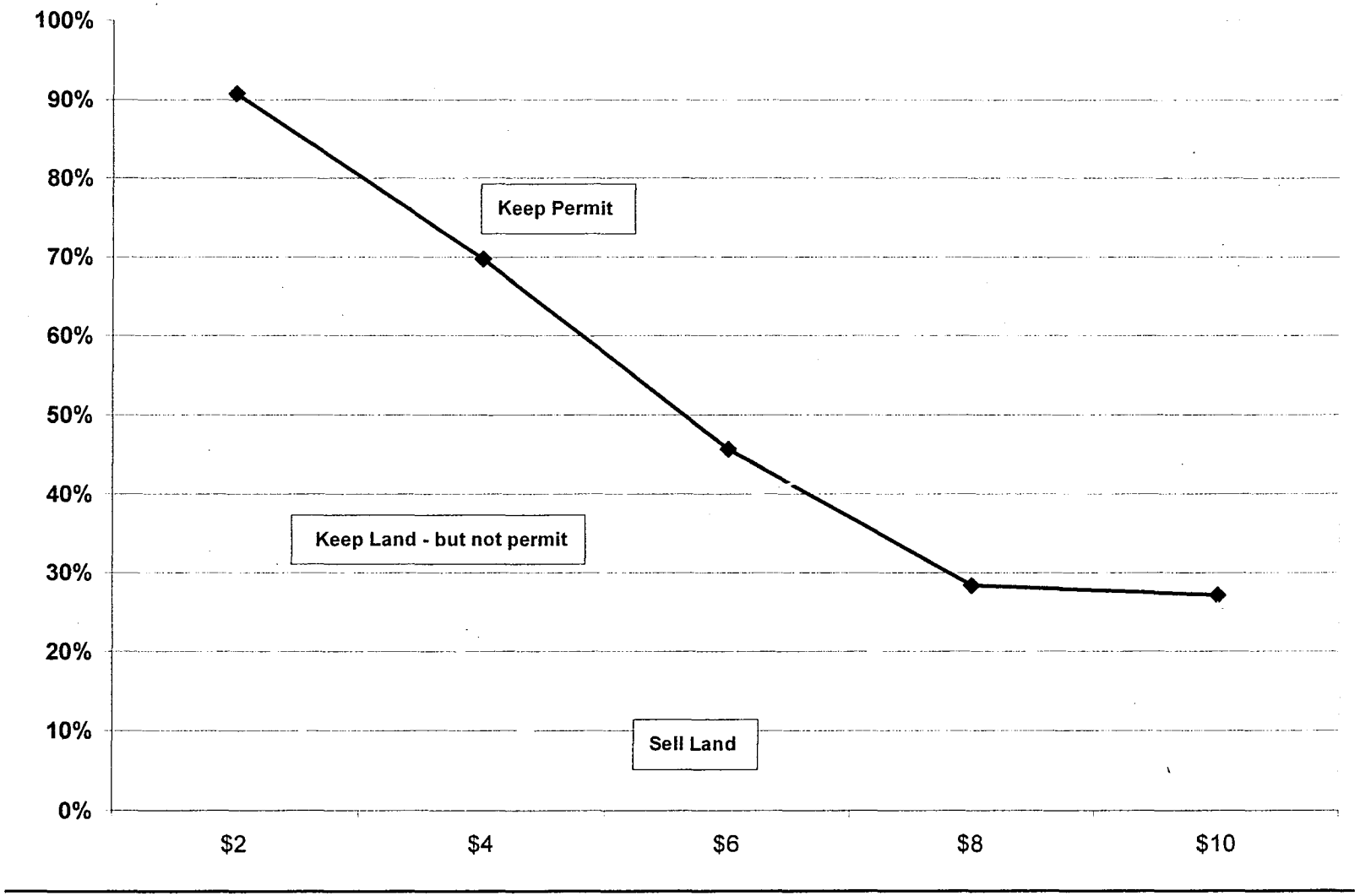

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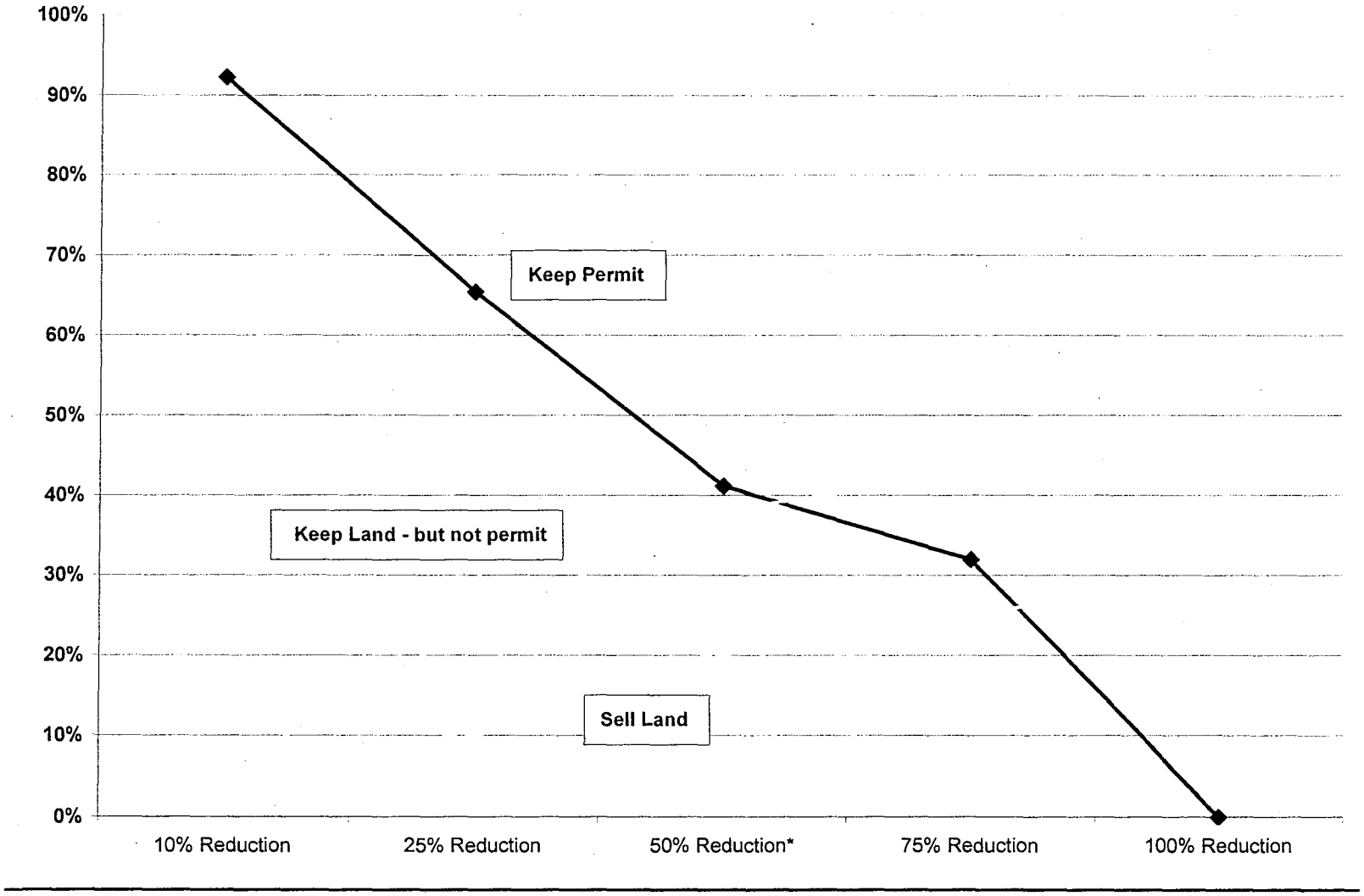

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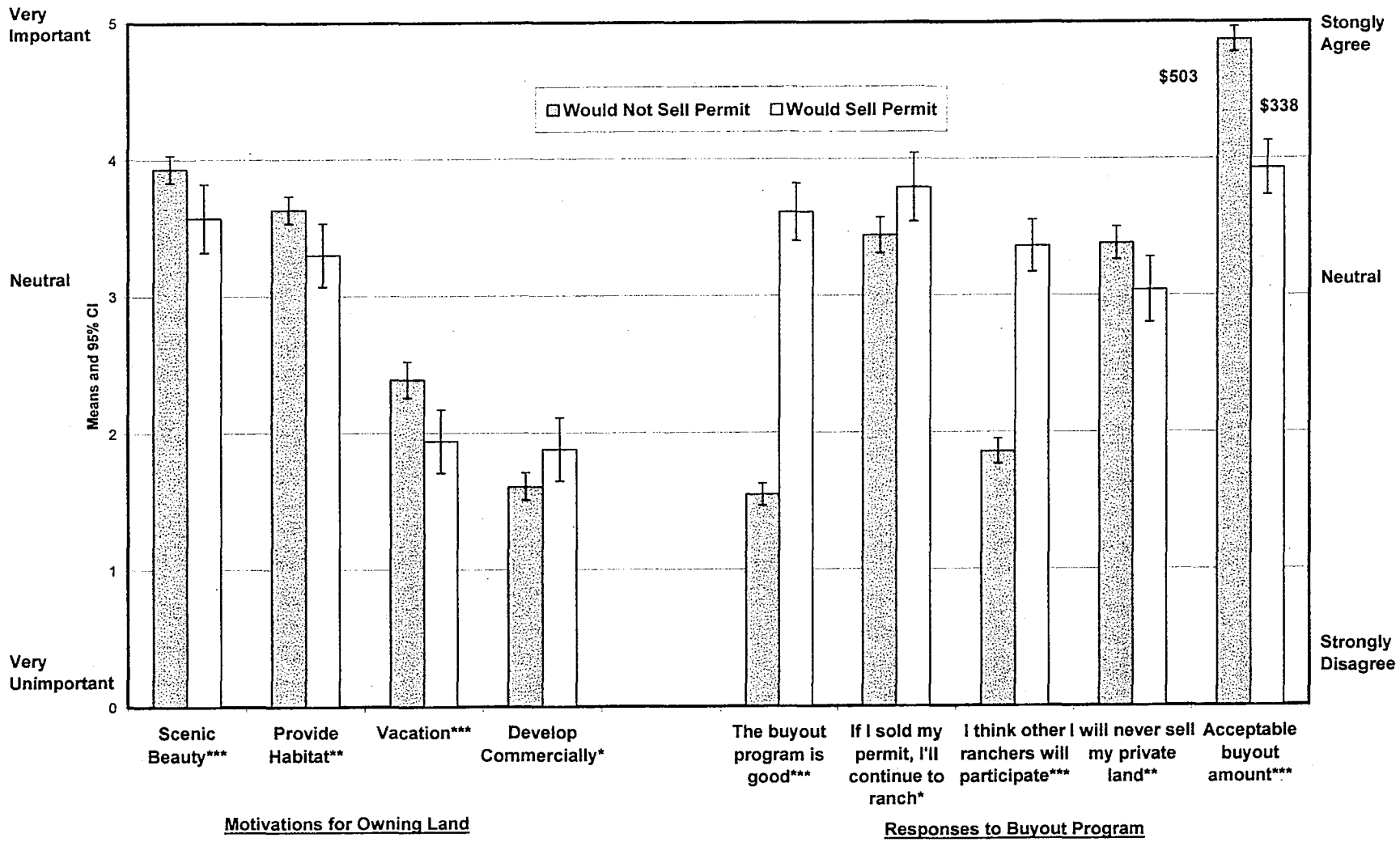

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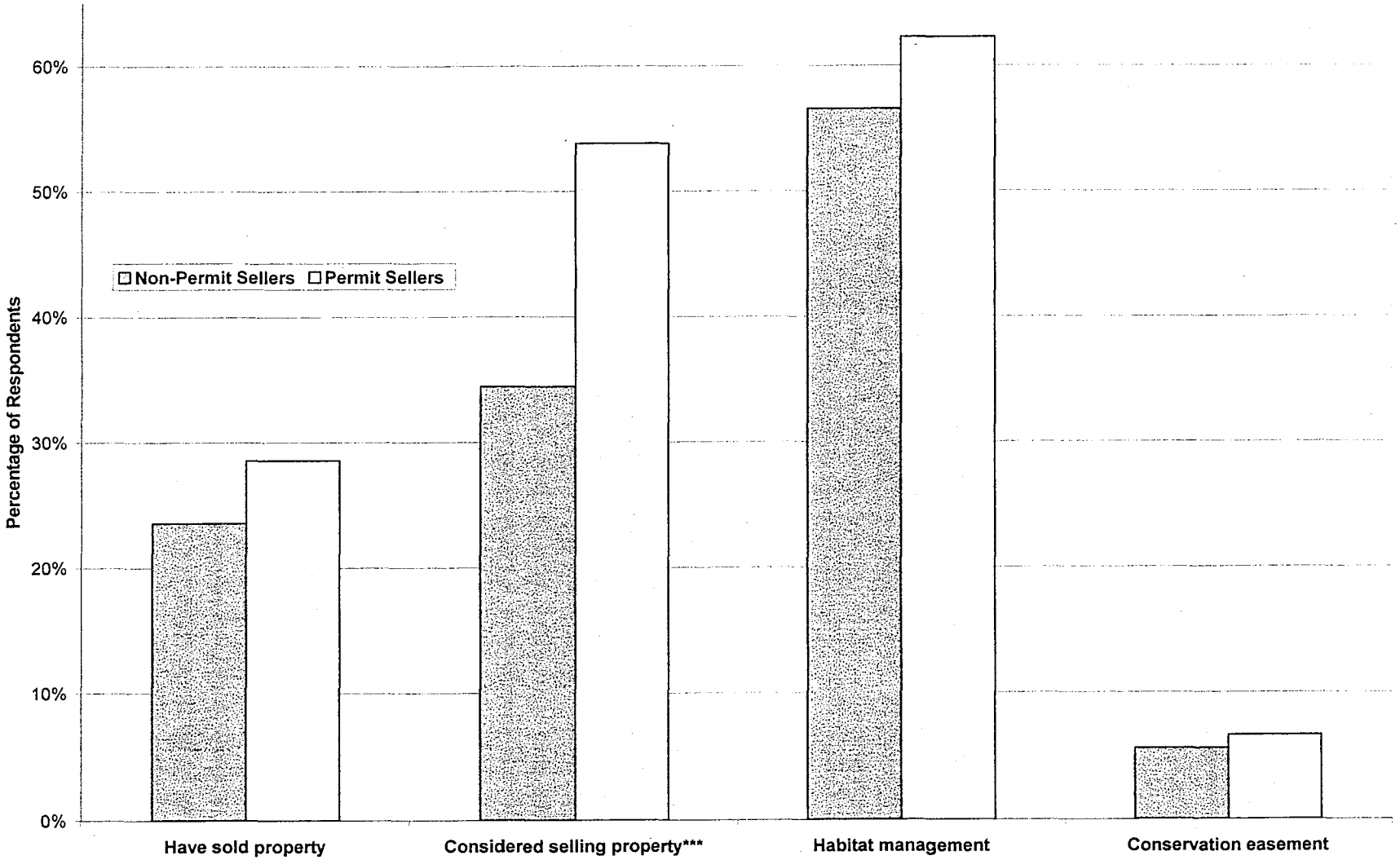

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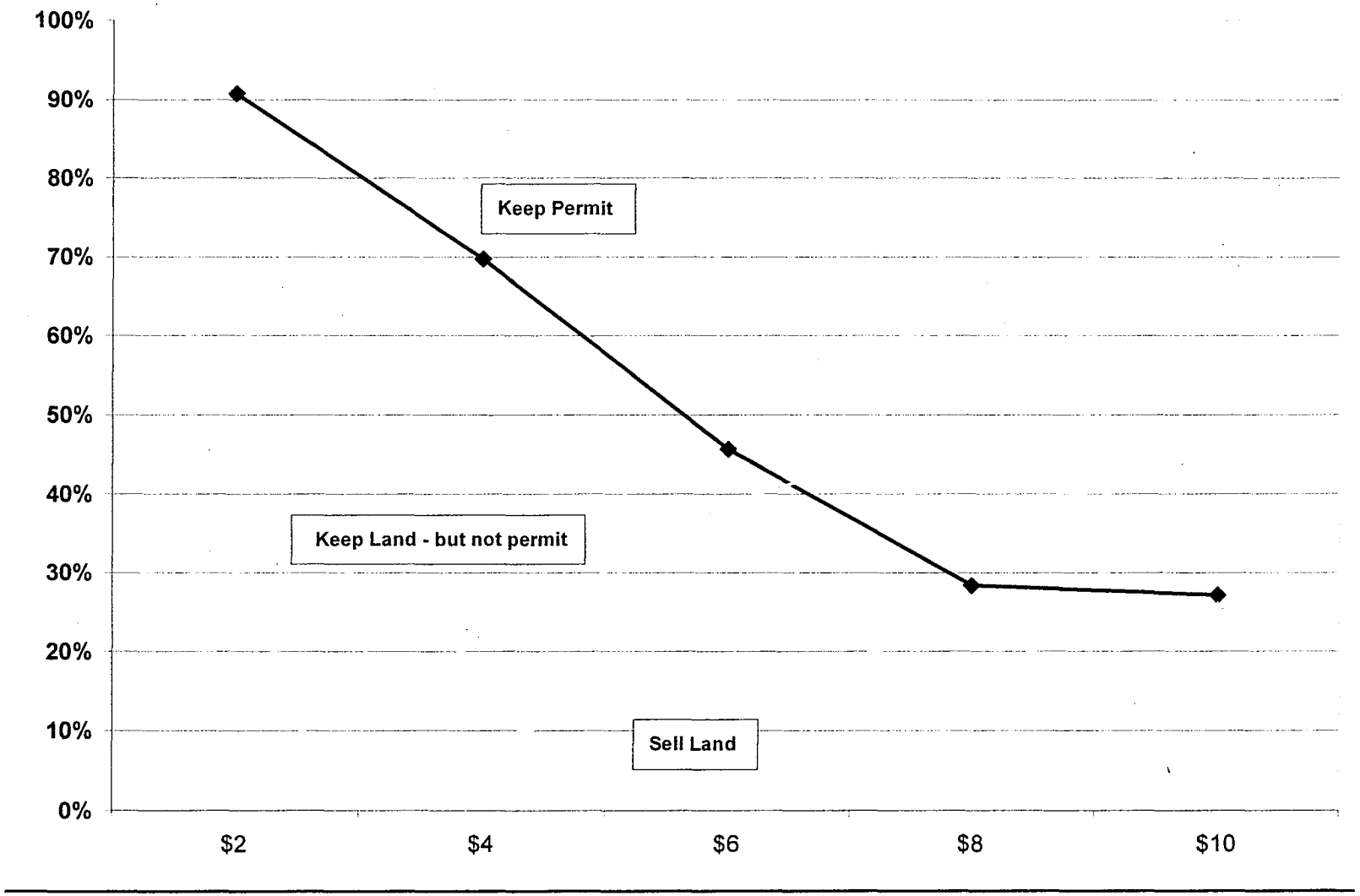

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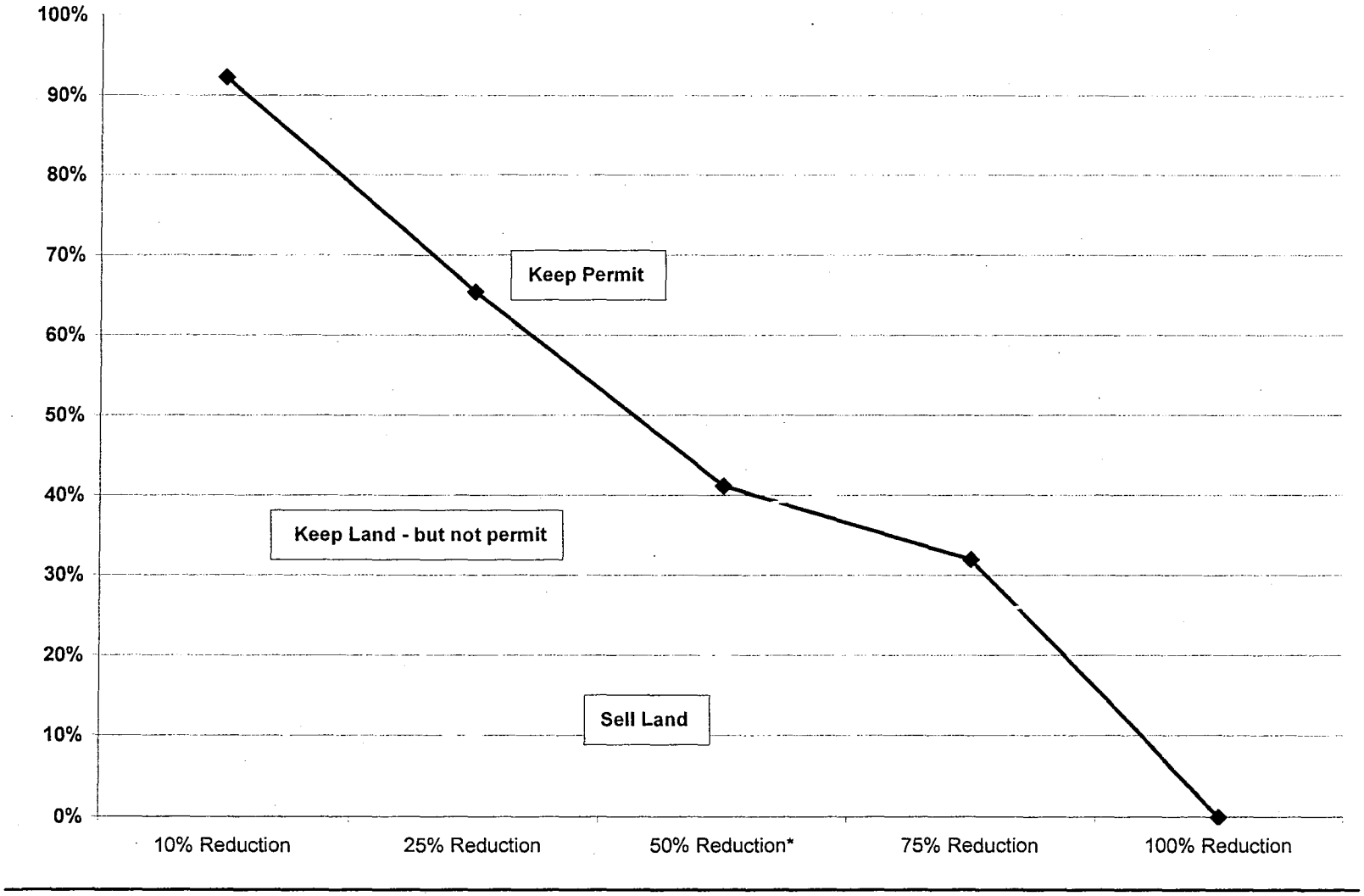

Interview Methods

We used a mixed-model research design, incorporating previously described quantitative survey data and qualitative interview data. We believe using this approach provided better insight to the study's complex nature; diversity of the study region; and the diverse population of permit holders. Due to the immense geographical area of concern and lack of pre-existing baseline data, the survey of permit holders was conducted first. This approach yielded a data set that provided insights to guide follow-up interviews, and identified a population willing to participate in follow-up interviews. Accordingly, our primary objective for interviews was elaboration on specific ideas, to uncover topics of concern not covered in the questionnaires, and to surface additional issues related to the proposed permit buyout program. Forty-nine semi-structured face-to-face interviews were conducted with permit holders and agency personnel distributed across the study area. These interviews provided key insights into differences between regions and raised concerns not previously considered.

The primary goal of the face-to-face open-ended[6] interviews was to improve insight into the data gathered from the survey, to "ground truth" the data that had been collected through surveys, and uncover pertinent factors relative to the consequences of the buyout that had been overlooked with the survey approach. However, after analyzing the survey data, it became clear that the real lack of information focused on permittees who were willing to participate in the proposed buyout program. After analyzing responses of respondents who were willing to sell their permits, and comparing responses to those who were not willing to sell, no immediately identifiable common threads

[6] Open-ended refers to the style of the interview, which asks a few predetermined questions, and then allows the interviewee to direct the interview with their comments or issues of concern.

emerged. As the focus of this study was the buyout program, it seemed apropos to interview a sample of respondents in these two groups to probe for differences. A random sample of respondents of willing and non-willing permit sellers was drawn and then contacted to arrange interviews.

In addition, we added another element to the research design – interviews with FS and BLM range management personnel from agency offices in the same locales as the interviewed permittees. We interviewed agency personnel to give us an overall feel for their attitudes toward permittees in the district and their perceptions of the proposed buyout program. These interviews proved to be a key to increasing our understanding of overall issues related to the buyout proposal.

Qualitative data requires a non-mathematical process for interpretation (Schildwachter 1997). The process we used involved coding for themes[7], developing each theme identified, determining the significance of themes, searching for hierarchies, and then comparing themes across interviews. Using this strategy, three broad themes emerged. The two initial themes involved reasons to sell their permit or the "why questions", and the potential consequences or the "what if's" regarding the buyout program. The "reasons to sell theme" was the main focus as such information could not be gathered from extant survey data. After speaking with individuals willing and unwilling to sell their permit, five major motivations emerged for selling permits. The first was administrative difficulties including both poor agency relationships with the administering agency or compliance with regulations or both. Additionally, impending retirement of the permittee from ranching was a common reason to sell, as was debt or

[7] A theme is an organizing unit with which an interview can be meaningfully organized, interpreted and presented.

money problems related to likely business failure. Two motivations not previously considered in the questionnaires that emerged were conflict with recreationists, and uncertainty related to continued use of public lands for grazing.

Prior to the face-to-face interviews, several potential consequences (fragmentation, increase fire risk) of the buyout program had been tentatively identified and those issues were raised in each interview in an effort to determine their validity. This broad theme contained two distinct sections – ecological and administrative consequences. These sections included several sub-themes including habitat fragmentation, water issues, and wildlife habitat loss. Additionally, several, new issues emerged including tax consequences, responsibility for fencing (construction and/or renovation, and maintenance), management of common allotments[8], and logistics of managing private or public land inholdings[9].

Finally, a third broad theme emerged which included recommendations or "how to's" that could improve the buyout program and range management in general. Although not all those interviewed had considered the details of the prepared buyout program, several had given the idea considerable thought and surfaced ideas which were germane.

Interview Results

Reasons to sell – After evaluating survey responses with regard to property size, full-time vs. part-time ranching, willingness to sell permits, geographic region, precipitation level, ecological region, and cluster analysis, no definitive motivations could be established for reasons to sell grazing permits. We concluded that establishing

[8] Common allotments are allotments where two or more permittees graze animals simultaneously or at different times of the year.
[9] An inholding is a privately owned parcel of land within the boundaries of a federal land.

such a rationale was possible but we had not yet asked the proper questions or series of questions to elicit such responses. We hypothesized that frustration with agency directives and difficulties associated with ranching federal land would be two motivations for permit sale. But, these two hypotheses could not be verified from survey data. After analyzing data from the interviews five distinct reasons to sell emerged — "agency influences", retirement, debt/money problems, conflict with recreationists, and uncertainty about the future of the public land grazing program.

Agency influences - We used the term "agency influences" to categorize two issues, 1) poor personal relationship(s) between ranchers and administering agencies, and 2) difficulty complying with regulations — most notably protection of threatened or endangered species.

Retirement – We could not establish impending retirement as a primary reason for participation in the proposed buyout from the survey data. Neither of the two "retirement" groups which emerged from the cluster analysis indicated a strong correlation with willingness to accept a buyout. Additionally, age was a significant factor differentiating between sellers and non-sellers – however willing sellers were younger. Coincidently, this trend was documented in the subsequent interviews.

Debt/Money problems – It was said by ranchers and critics alike, that public land ranching is a difficult enterprise, and few, if any, are getting rich in the process. Yet many choose to pursue this lifestyle, for the simple reason that they enjoy it. However, intermittent negative investment returns are far different from sustained losses. These back-to-back years of losses are prevalent where drought has persisted since the late

1990s. Individuals most negatively affected by this situation had either leased more permits prior to the beginning of the drought or were having difficulty paying loans.

Recreation conflict – A previously unaddressed conflict issue that emerged was the ill will between ranchers and recreationists. In certain areas with high recreation value, the conflict between the public and permittees finally created enough stress to prompt some ranchers to want to quit the business, at least when it relates to using public land. The primary complaint was the misbehavior that some recreationists exhibit on public lands including leaving trash, leaving gates open, carelessly using water sources, chasing livestock, and destruction of habitat. In particular, some permittees interviewed felt that these events reflected poorly on them in the eyes of the land management agency who personally hold them responsible for something that they did not do.

Uncertainty – The issue of uncertainty could be detected in almost all the interviews, but was not precisely identified as such. This evident trepidation on the part of those interviewed was based on events that had not yet occurred but seemed likely. In some cases, it was the fear of having permitted numbers further reduced, or the scenario of finding a threatened or endangered species on their allotment, or possibly, have their allotment revoked or permitted numbers reduced if new personnel with a "green orientation" moved into their district office, or emergence of poor economic markets. While these factors were hard to specifically identify, and the issue was difficult to quantify, such fears were clearly present among a significant portion of those who would sell, as a way to escape an amorphous, but quite real, pervasive insecurity.

Potential Consequences – The primary concern of proponents for the proposed grazing permit buyouts is that livestock grazing is detrimental to public land health[10] (NPLGC 2004c). Clearly, even today, there are instances of abusive grazing on public land and, perhaps the proposed buyout program could be used to address these problems. However, we found no published material or research in progress to determine participation rates or the likely outcomes (ecological, economic, social) of the proposed buyout for ranchers, communities, landscapes, or agencies. The following comments and insights gained in the course of the investigation provide clarification of potential consequences.

Ecological – This proposed buyout program is rooted in concern about the impact of livestock grazing on public land health. However, public lands are only one facet of the landscape. Private lands comprise the other part, and are generally the most biologically productive lands and have an equal or greater role in assuring landscape health. Private lands provide "open space" with the retention of multiple benefits (aesthetics, recreational use [including hiking/hunting/fishing], ecological benefits, wildlife habitat, and intrinsic aesthetic value). In particular private land open space is valuable in terms of wildlife habitat – specifically winter range for wild ungulates, and hydrologic benefits.

Habitat Fragmentation – The concern for increased land fragmentation is a preeminent concern voiced by opponents of this legislation. Those in the ranching community have often espoused, "cows not condos" as a "lesser of two evils" argument

[10] Public land health is defined as the degree to which the integrity of the soil and the ecological processes of public land are sustained. Public land health exists when ecological processes are functioning properly to maintain the structure, organization, and activity of the system over time.

to justify continuation of the status quo. Those in favor of the proposed buyout declare the argument a false one, and that private lands and landowners are not a critical part of landscape health (NPLGC 2004a). Nevertheless, land fragmentation is an ongoing and accelerating phenomenon in western states, and is a growing concern (Theobald 2000). Most notably, the concern seems to stem from the fact that the majority of public land ranching operations are highly dependent on public land. Without the public ground for grazing, deeded property – particularly smaller properties, become obsolete in terms of a viable agriculture operation.

The certainty that ranchers without permits could continue ranching on their private land was only expressed by one person during the course of the interviews. That individual felt that people would continue to own their private land because they would receive a large amount of money from the buyout and would then be dependent on private land — owned, purchased or leased for ranching. That seems counterintuitive, as many public land related ranching operations privilege are based on a small piece of private property, ("base property") which affords them access too much larger tracts of public land for grazing – most commonly seasonal. If a rancher accepted the buyout, no secondary protocols exist to improve the probability that they will maintain their private property in ranching/agricultural use, especially if they do not own enough land to maintain a viable livestock operation.

Proponents also noted that revenue from a buyout could be used to acquire additional private land for ranching, which one agency person noted as well (NPLGC 2004b). This possibility was based on purchasing land in more arid areas where land is not now, nor is likely to be, valued for development. However, in most cases, this

argument relative to most small ownerships is weakened by the high and often increasing market values of private property for purposes other than ranching/agricultural use.

Those in favor of the buyout argue that this program will help those with significant debt loads secure enough money to pay off loans, which, in turn, will help them maintain their private property (NPLGC 2004b). However, this argument weakens when considering that future generations on these lands will be dependent on ranching revenue from a reduced size of operation and there will still be a need for income to pay property taxes on lands commonly increasing in value faster than inflation and make a livelihood. The chain of events is believed by some to more typically end with the sale of private land for subdivisions or hobby ranches or both.

Winter Range – An argument closely tied to concern over habitat fragmentation concerns private lands that serve as winter range for ungulate wildlife. Typically wild ungulates utilize drier and higher elevation terrain (public land) during the spring-fall months, and migrate to lower elevation private land which has more moderate climates and less snow during the winter. This is a particular sticking point with many ranchers, who see themselves as subsidizing a public good (wildlife) without compensation when wild ungulates eat hay, use water sources, consume supplemental feeds, and have potential to spread transmittable diseases to their livestock. In addition, the seasonal importance of private lands for many wildlife species, (sage-grouse often use private irrigated meadows during summer for brood rearing habitat as an example, and this may be critical during drought periods) should not be overlooked.

With increased land fragmentation resulting from the sale of property no longer viable for ranching will certainly have some degree of negative impact for wildlife

populations that use lower elevation private lands in the winter. It should also be noted that public lands serve as winter range for numerous species such as moose, pronghorn, and bighorn sheep. However, any potential improvements in conditions on public lands may be negated by fragmentation of the habitat on private lands in situations where that habitat is the more limiting factor. If winter range was the limiting factor for a big game population and private lands provided a significant proportion of that wintering habitat, fragmentation of that winter habitat could result in declines in the population regardless of any potential improvements realized on the less critical public lands. This kind of analysis should be done to determine potential impacts prior to acceptance of any buyout proposal.

Water loss – Prior to conducting interviews, we had not considered the role of man-made water sources for wildlife use or in terms of continued maintenance of such water sources. However, numerous comments were made during interviews concerning the importance of such water sources played for wildlife populations – particularly ungulates. Some wildlife populations have become dependent on these water sources and their continued maintenance. If these water sources are deemed valuable for ecological reasons their continued existence may be deemed essential and function must be evaluated and carefully monitored (Burkett and Thompson 1994).

Administrative – In addition to the potential ecological consequences associated with the buyout, numerous administrative issues will arise and require attention and resources from land management agencies. Specifically, the subdivision of at least some of these private lands raises questions regarding the growing wildland/urban interface (WUI). The WUI describes private property that adjoins public lands developed for

housing and associated development. Such areas have become increasingly controversial as more people migrate to rural areas and build on habitats that abut public land(s). The wording of the proposed legislation relative to buyouts is limited in terms of what management role agencies will have relative to retired allotments. Range managers and private landowners with adjacent property to public lands alike expressed unease about what kind of maintenance would be allowed, and who would be responsible for management. Issues of concern raised by both parties include fire danger, maintenance of water resources, fencing responsibility, allocation of common AUMs, and to lost potential for grazing as a management tool for vegetation.

Fire danger – In the practical sense, the WUI is an increasingly politically sensitive area as related to appropriate federal, state, and local fire management. As the interface grows, management duties for agencies will increase. This threat of increased fire risk from fuel accumulation without grazing was a concern posed by those who do not favor a buyout. Some respondents argued that regular grazing keeps fine fuels (grassland species, and shrubs) at lower levels. This argument has been dismissed by others claiming the converse — that grazing is to blame for wildfire, or that many areas do not produce enough fine fuel to carry a fire (Wuerthner 2003). Nevertheless, the concern of fuel accumulation over time is real among ranchers and to a lesser degree public land managers. However, recent dry years coupled with several years of intense fire seasons with climbing numbers of acres burned, liability issues related to "escaped" controlled burns, and intolerance of smoke, seems likely to severely limit the use of prescribed burning as a tool in the WUI.

Water maintenance – Previous discussion of water resources focused on the ecological impacts of man-made water sources on allotments. While the ecological value remains clouded regarding its necessity for wildlife, or as a point source for ecological problems, maintenance of such water sources is an issue of concern. In the event that a permittee sells their permit, they will no longer have a responsibility or need to maintain water resources, which could lead to two scenarios.

If it is deemed necessary to maintain these water sources for wildlife populations or for use by recreationists, then the maintenance responsibility would fall to the land management agency. As many ranchers pointed out, they invest time and dollars each year in maintenance of water sources and in some case maintain water systems that stretch miles and have provided sources that number in the hundreds. In terms of financial costs and man-hours to maintain such systems this could present land management agencies with additional responsibilities and associated costs. This point was not lost on agency personnel, who agreed it could be a burden and would at least require a reevaluation of their land management plans in the absence of grazing permittees. Likewise, in some instances, permittees own water rights on federal lands. In such cases on a retired allotment, if the agency had a need for water, it seems likely that they would have to purchase water from the former permittee.

On the other hand, if these water resources are seen as attractive nuisances for humans and wildlife and inflict more harm than good, removal will be necessary. Even the one time cost of removal, may entail dismantling windmills, removing water troughs, breaching catchment tanks, and digging up pipeline. In the case of more northern FS areas (ID, WY, MT) live water (springs, creeks) occurs on most allotments, and would

not require the same attention as more intensive water systems of the Southwest (CO, UT, NM, AZ). Water is a particularly critical issue in the drier southwest, although it is more often naturally available at the higher elevations and becomes more critical in the drier lower elevation areas. Currently, government agencies (state and federal) spend money on developing water resources called "guzzlers" and other resources to furnish water for wildlife. So, a precedent exists for the continued existence of at lease some artificial water resources in some manner.

Fencing – The issue of responsibility for fencing had not been previously considered, yet almost every interviewee brought up some discussion on the subject. These discussions led to three key points.

1. Foremost, was the concern that once a permit is retired, the permittee, or the landowner, that shares an adjoining fence line would be responsible for fence maintenance and/or installation. Several individuals felt that this would be a significant burden in terms of money and workload, especially in areas with large allotments which may include numerous miles of fence. Additionally, some viewed the issue as one of ownership, as the agencies are the ones who are buying the permit, and then they should have to maintain the fence like any other permittee.
2. The second issue concerned building fences where none exist between private and public land. In most such cases permits exist adjacent to private land, as in the WUI, which allows ranchers to move cattle easily between deeded ground and public ground. In some instances particularly large sections of the private/public boundary are unfenced for this purpose. If a permittee were to sell

a permit, he would be required to fence this boundary to prevent a trespass of his livestock onto public land. Costs could range in price from $2000 - $20,000 a mile in extreme cases depending on topography, materials, and access. This financial responsibility could, in effect, nullify any gains made from selling grazing permits.

3. The third issue involves maintenance of existing fences on public land after permittees exit. This was primarily a concern to agency personnel, who viewed it as adverse to wildlife and, potentially, a financial burden to agencies. Several noted that leaving the fence intact and unattended would eventually lead to trouble for migrating wildlife, particularly elk. If removal were deemed a necessity the cost could be substantial.

Common AUM management – Another topic related to fencing would be management of grazing allotments that run "in common." The term "in common" refers to multiple permittees sharing the same grazing allotment, simultaneously, or during different grazing seasons. The challenge is how to remove the purchased AUMs from a common allotment if, only one permittee sells his portion of the larger pool of common AUMs. What is dictated by the legislation may make it more difficult to manage common allotments. The current language states that:

> ...where the managing agency is physically unable to secure a representative portion of a shared allotment from grazing, permittees or lessees who graze that allotment will not be permitted to participate in the voluntary grazing permit buyout program unless all grazers on the shared allotment agree to retire their permits or leases[11].

[11] Voluntary grazing permit buyout act (H.R. 3324) annotated. Section 6. Effect of waiver or donation of grazing permit or lease. Subsection (b) securing retired allotments against unauthorized use. (NPLGC 2004e)

The occurrence of common allotments is less frequent than individual allotments. Nevertheless in every area we visited common allotments did occur. The nature of common allotments means that they are typically large in size relative to individual allotments. In the event that one common permittee sells and others do not, management agencies will be responsible for constructing and maintaining fences to fence off the representative portion of the allotment, which could be costly as previously shown. Additionally, how can an individual in a common allotment be precluded from selling their permit, if everyone in the common allotment does not want to sell? This program is promoted as a voluntary way for permittees to escape debt or cease grazing public land as a way to improve range health. It seems that in this case it does neither. The removal of any livestock from the total authorized numbers would lower the numbers of AUMs, but the associated cost of operating the allotment might not decline for remaining permittees.

Permanent Retirement / Future Use – Several agency personnel questioned us as to the reality of the wording "permanent retirement". The real question was, did the retirement of the allotment prevent the agencies from using grazing as a tool for range management if that were later deemed desirable? The language in the proposed legislation does not address this point, but seems to indicate that no livestock would be permitted on these allotments ever again under any circumstances. If this were the case, several agency technicians expressed concern over the implied loss of managerial flexibility. The main question was: What if it was determined that the range had been appropriately "rehabilitated" could the area be used to provide relief from grazing on other allotments?

Inholdings - A different issue requiring more detailed analysis is the question of how it would be feasible to buyout a landowner with public inholdings surrounded by private land(s) and how to manage those inholdings. Two types of inholdings are common throughout the west. "Checkerboarded" lands are properties typically found along railroads, resulting from a mid-1800's federal policy that granted alternate sections of land to different railroad companies to encourage development. The result is 20 – 40 mile wide areas with private, state, and public lands intermixed in 1-mile square intervals (Donahue 1999). In addition, mining claims, and homestead laws, operating in the 1800s, created numerous inholdings of private lands within federal lands with irregular boundaries interspersed throughout public lands in the West. If these inholdings are linked to the proposed buyout program it could create unique management obstacles in three ways.

1. In either case, but particularly in the case of checkerboarded land, landowners have made numerous improvements such as roads, culverts, and gates. Whose duty is it to maintain those improvements on public lands once permittees are absent? If it is the agency's responsibility it may create an additional workload and maintenance responsibility.
2. Fencing is a concern on these checkerboards, as all private sections would have to be fenced to prevent any trespass on their livestock onto federal lands – if the private lands are to remain in livestock production. In the majority of the arid regions on which ranch lands are most common stocking density ranges between 2-10 AUMs per section, or per square mile or "checkerboard" block. This creates an obvious unreasonable expense for the rancher using his private

land for ranching in terms of movement of livestock between private land sections. Additionally, if the landowner does choose to continue ranching in this circumstance, can he trail livestock across public lands on which grazing is no longer allowed or will he have to trailer all stock to move between private land holdings?

3. Finally, it was pointed out that those individuals with small public inholdings surrounded by private land would probably be inclined to sell their inholding allotments knowing that it would be difficult to enforce a trespass on those inholdings. In effect they would benefit from selling their AUMs and potentially still use those inholdings without fear of a trespass because it is difficult to monitor their use.

Cultural and Community Impacts – Cultural and community impacts are often not a deciding factor in policy analysis because they can be difficult to quantify in economic terms or may be considered frivolous by some involved. Nevertheless, some in the ranching community are quick to point out the value that their operations provide the economic/social sustenance of small communities, the West as a whole, as well as to themselves. Consequently, four points emerged concerning the impacts of the program to individuals and communities.

Lifestyle loss – Proponents of the proposed buyout typically dismiss loss of lifestyle as a reason to continue public land ranching and offer that this lifestyle is not that important to rural communities. However, there are clearly aspects of this proposed program which may have adverse effects on non-participating ranchers and involved communities. In most cases, some ranchers viewed this program as a "chink in the

armor" of the ranching industry, and while such a program may be initially promoted as voluntary, ultimately they fear mandatory removal as their collective political influence declines over time.

Community impact – The economic contribution of public land ranching has been called into question on numerous fronts, citing the relatively few number of jobs tied directly to public land ranching compared to employment in the entire western region. And, those relatively few jobs provide little real economic stimulus, directly to individuals or to communities or the region (Power 1996). It has also been stated that ranches are more dependent on the rural communities than communities are dependent on ranching (Wuerthner and Matteson 2002). From a purely economic standpoint these assertions have some merit. However, the overall influence of ranches on communities may be understated. Additionally, as ranching operations disappear whatever section of the economy they do provide, will disappear. There likely will be some ripple effect in terms of associated service jobs and supplies.

State Grazing Lands - On a larger community scale, one idea that was brought up concerned the state grazing lands that intermingled with federal lands. In previous discussions about inholdings, private lands were the primary focus. However, in many cases state lands are "checkerboarded" and therefore, intermingled with federal and/or private lands. If a permittee sold his permits to graze federal land, it seems probable that this could sometimes effectively nullify any capability to generate revenue for the state from grazing. Typically state lands are small and unable to support entire herds, and are landlocked and managed cooperatively with the federal lands which are not fenced off. If there was interest in using the state lands for grazing, previously described issues listed

with inholdings would come into play. Additionally, the required fencing would likely be cost prohibitive due to dramatically increased amounts of fencing required on unfenced areas. If no water sources existed on the state lands use of these land for grazing may be rendered impossible. Finally, it should be noted that most state lands are managed under a trust doctrine which stipulates that the lands produce revenue for state purposes — most notably school programs (Souder and Fairfax 1996).

Financial Issues – What would the buyout produce in terms of a tax liability to ranchers? And, what would be the effect on local tax bases? How would the buyout money be treated by the Internal Revenue Service (IRS)? Would income from the buyout be considered a capital gains or simply fully taxable income? Some of these questions have been raised by proponents as well, and have sought legal counsel (Perkins Coie 2004), but no definitive ruling has been provided by the IRS. In some cases permittees have investments on the allotments in the form or fences, gates and water sources. Would they be able to write off these expenses? Currently, grazing permits are viewed as a privilege, not a right, so how would the IRS view someone selling something that they do not own (U.S.C. § 315 1934). One astute rancher pointed out that the $175 would be substantially less after paying taxes, and assuming the coincidental sale of the livestock that were grazing on the public land would create an even larger tax burden. These two combined ideas have been either unexpected or unannounced to individuals likely to participate.

From the majority of interviews the $175 proposed legislation amount seems to be on par with the most valuable permits and considerably above market value in other areas. This $175 value was used solely for hypothetical purposes because the proposed

2004 legislation used this figure. This disparity results from the obvious fact that AUM lease rates in the private sector vary widely ($3/AUM to $20/AUM) depending on the circumstances of the land being leased. All AUMs on federal lands currently lease for $1.79/AUM ($1.90 FS grasslands). However, data from the mail survey indicated that even those ranchers interested in participating in a buyout are inclined to require double the amount offered ($350) before the offer would be widely acceptable, and those who do not want sell say they would require almost $500/AUM before seriously considering selling. Those proposing the buyout claim that ranchers can use this money buy additional land for their operations. In order for this to occur the price would have to be substantially higher than $175 for ranchers to garner enough money to purchase land for replacement grazing given high and accelerating market values. Current agriculture land values in the region currently range from $100/acre to $3000/acre (USDA 2002), with market values exceeding $7,000/acre in some areas, which in most instances would be too expensive to allow purchase or lease of private grazing lands from revenue gained in a buyout.

Concerns for program improvement - Several recommendations for improvements in the proposed buyout program and for the agencies management of public land grazing were brought to our attention. The general sentiment was that such a program could be useful in dealing with public land grazing issues, but in its current form it would present multiple obstacles for which there are no easy solutions. Some individuals saw the program as "adversarial" towards ranchers and preferred that it should be promoted as a way to help ranchers and improve ecological land health — both public and private. Several key recommendations emerged in the analysis.

Specific Management – One topic that frequently arose was the need for flexibility to address various regions. Many ranchers thought that they were subject to an overarching set of rules that ignored ecological relationships which were both ineffective and limiting. It was suggested that range managers should allow more flexibility for ranchers and managers to make site specific decisions, and create regulations tailored to different ecological regions to fit differing circumstances.

Land Swaps - Many of the issues raised in the section of the report detailing ecological and administrative consequences of the proposed buyout deal with management of retired allotments – in particular, the potential difficulties related to managing "checkerboard" lands, lands with irregular boundaries, and inholdings. The consensus among ranchers and agency personal who were interviewed was that if the buyout program was to be even remotely feasible for agencies to manage and for landowners to adequately utilize their private property — lands in "checkerboard" patterns or otherwise mixed, might have to be consolidated into large blocks of federal, state and private land. Mechanisms exist for these types of land exchanges, but are burdensome, slow, and expensive. Handling the volume of exchanges necessitated in this case, would require significant increases in personnel and funding — and, likely, development of a streamlined process. Even the relatively small numbers of land exchanges that currently occur are subject to intense scrutiny and criticisms. It is likely that, to be feasible on such a large scale, associated land exchanges would have to be legislated.

Phase outs – Ranchers who brought up issues related to associated taxation issues, believed that the impact could be mitigated if the buyout program was designed to

include the possibility of a gradual phase out of grazing from involved allotments. This phase out might accomplish three things: 1) allow ranchers to gradually sell off remaining livestock; 2) divide the payout over several years reducing tax burdens; and 3) provide time to develop a strategy for dealing with the associated private land.

Increase buyout amount – In order for the program to be widely utilized the $175/AUM fee that the study evaluated would need to be increased as; 1) in some cases the current amount did not appeal to individuals who were successfully ranching and deemed their permits to have more value than $175, and 2) If a permittee were to sell the amount gained would not be adequate enough to procure additional private land capable of carrying the number of AUMs sold.

Split fee for conservation – An agency technician realized that the ecological condition of public lands could be improved through reductions in annual livestock use. But the associated private lands were of equal concern in terms of ecological condition. It was suggested that the receipts from a buyout could be split — part going to the rancher for AUMs surrendered on public land, and part going to protection of associated private land in the form of easements or through outright purchase of the property for addition to the public land base (i.e. simultaneous purchase of the associated private property could be a rational ecological/economic/social solution).

Grassbanks[12] – Grassbanks are in scattered use in different parts of the west. The benefit of grassbanks is that ranchers can rotate livestock to better range in order to rest currently grazed range for conservation purposes. In exchange, those involved in a

[12] A partnership that leverages conservation practices across multiple land ownerships based on the exchange of forage for tangible conservation benefits. Grassbank can also refer to a physical place where cattle are temporarily located to feed on forage while home rangelands are undergoing restoration and conservation activities.

grassbank agree to protect their private lands for one or more of these purposes: open space, ecological benefits, and endangered species conservation. The idea of utilizing retired allotments for use in a grassbank was brought up by several agency personnel. They viewed this type of program as a benefit to them for management to improve overall public land range condition, and to help remaining ranchers by providing forage and resting current allotments.

Regional Cost Analysis

Overall costs of participation in several regions were projected to illustrate potential costs of the proposed buyout program. The overall analysis used the total number of AUMs currently allocated by both agencies (17,617,986)[13] to estimate the cost of a permit buyout at various prices and participation levels (Table 2). Additionally, five regional analyses estimated[14] costs for participation in the buyout at rates of 100%, 50%, 10%, at $175 per AUM. Costs were estimated for maintaining/removing fence, and managing range improvements (Table 3). These two management issues were selected for illustration as they were the easiest to quantify in quantity, and were likely two of the largest associated financial and workload burdens to agencies. A thorough cost/benefit analysis, of course, would require detailed data from each managing office, as well as site specific assessments, which is beyond the scope of this study.

[13] As cited by (NPLGC 2004c)
[14] Information gathered for this analysis was based on personal interviews and subsequent communication with agency personnel.

Table 2. Direct buyout costs with different rates of participation

Total AUMs	17,617,986				
	10%	20%	30%	40%	50%
$50	$88,089,930	$176,179,860	$264,269,790	$352,359,720	$440,449,650
$125	$220,224,825	$440,449,650	$660,674,475	$880,899,300	$1,101,124,125
$175	**$308,314,755**	**$616,629,510**	**$924,944,265**	**$1,233,259,020**	**$1,541,573,775**
$350	$616,629,510	$1,233,259,020	$1,849,888,530	$2,466,518,040	$3,083,147,550
$500	$880,899,300	$1,761,798,600	$2,642,697,900	$3,523,597,200	$4,404,496,500
	60%	70%	80%	90%	100%
$50	$528,539,580	$616,629,510	$704,719,440	$792,809,370	$880,899,300
$125	$1,321,348,950	$1,541,573,775	$1,761,798,600	$1,982,023,425	$2,202,248,250
$175	**$1,849,888,530**	**$2,158,203,285**	**$2,466,518,040**	**$2,774,832,795**	**$3,083,147,550**
$350	$3,699,777,060	$4,316,406,570	$4,933,036,080	$5,549,665,590	$6,166,295,100
$500	$5,285,395,800	$6,166,295,100	$7,047,194,400	$7,928,093,700	$8,808,993,000

Some costs were estimated in the following analysis to give "ball park" estimates as there was no definitive source for better information. In the case that no definitive data was available for miles of fence, the amount of fencing was estimated based on the total acres under management by dividing the total acreage by 640 acres (1 square mile) which provided an estimate of miles of perimeter fence. If no data was available relative to interior fences, no effort was made to derive estimates for such circumstances. Consequently, estimates for fencing – both removal and construction – are likely significantly understated. The associated cost for fencing was based on the price for fence removal, which is the most likely scenario if allotments are permanently vacated. A fee of $1/foot or $5280/mile was used for the cost of fence removal. The cost of fence building, if required, would be at least 2 to 3 times higher based on estimates from agency personnel.

Total costs of maintenance of water improvements will likely be a lesser cost than fence removal or construction, as there are fewer water improvements on allotments in northern regions. If there are water improvements in place (windmills, pipelines, troughs, pumps, etc.) many ranchers would likely remove them if they had purchased them outright, or may elect to leave the improvements if it costs him more time and effort to

remove them that the value of the equipment. Likewise, some improvements were purchased or installed partially with agency funds, and may stay with the allotment. Consequently, to illustrate potential costs, only 30% of all water sources for each region were calculated to require some sort of attention either removal (dam breach, dismantling) or required maintenance, with a one time maintain/remove cost of $1000. Dealing with gates and cattle guards was difficult to quantify, but all allotments have at least one gate, and more than likely two, therefore the estimated number of gates/cattle guards was calculated by multiplying the total number of allotments in each region by two. As before, a one time cost of removal/maintenance for these structures was calculated, using a cost of $200.

All estimates are conservative in terms of costs and amounts. In some cases, agency personnel could not provide requested estimates. Additionally, these estimates are presented solely to illustrate the possible (and likely less than minimal) costs not recognized previously by the agencies involved or proponents to buyout. In addition, none of the costs that might shift to remaining permittees are calculated due to the high degree of variability among and between individual allotments and operations. A 100% participation rate is unrealistic and is presented only as a baseline. A 50% participation is presented based on the claims of proponents of this legislation, who claim that a majority of public land ranchers would participate if this program were passed (NPLGC 2003a, NPLGC 2003b, PRR 2003, AGPBC 2004). Finally, a 10% participation rate is presented based on information gathered from the survey and interview data of this study. The survey data indicated an 17% participation rate among respondents. However, in conducting interviews several months after their surveys were received, approximately

1/3 of those in favor of the buyout according to their survey answers had reconsidered and were no longer in support of the idea, reducing the participation rate to 11%.

The bottom line is that even marginal participation (10%) would cost a little over $300 million just to purchase the AUMs, not to mention the costs detailed above (Table 2). In combination 90% of the allocated AUMs would still exist and require management by the agencies. It is undisputed that the current grazing program costs the land management agencies more to conduct that is received in associated revenue. These estimated differences range from a low end of $100 million calculating only direct receipts and expenditures of the range program, to a high of $500 million based on numerous indirect costs accrued though other programs within the agencies (land management planning, inventory and monitoring, recreation, heritage and wilderness, wildlife and fisheries habitat management, vegetation and watershed management, national fire plan) (Moskowitz and Romaniello 2002). While each of these indirect costs are accounted for as a whole and are undoubtedly involved to some degree, no direct accounting is given to the cost associated with grazing.

Table 3. Estimated direct and indirect agency costs by region based on rates of participation

Las Cruces Field Office BLM (NM)		100% Participation	50% Participation	10% Participation
Total AUMs	378,832	$66,295,600	$33,147,800	$6,629,560
Total Allotments	362	0	181	326
Miles of Fence	8,750	$46,200,000	$23,100,000	$4,620,000
Water sources	800	$240,000	$120,000	$24,000
Total Gates	1,448	$289,600	$144,800	$28,960
Total Acres	5,600,000	0	2,800,000	5,040,000
Total Cost		$113,025,200	$56,512,600	$11,302,520

Helena FS Ranger District (MT)		100% Participation	50% Participation	10% Participation
Total AUMs	13,880	$2,429,000	$1,214,500	$242,900
Total Allotments	58	0	29	52
Miles of Fence	325	$1,716,000	$858,000	$171,600
Water sources	68	$20,400	$10,200	$2,040
Total Gates	116	$23,200	$11,600	$2,320
Total Acres	393,904	0	196,952	354,514
Total Cost		$4,188,600	$2,094,300	$418,860

Pinedale FS Ranger District (WY)		100% Participation	50% Participation	10% Participation
Total AUMs	53,740	$9,404,500	$4,702,250	$940,450
Total Allotments	94	0	47	85
Miles of Fence	110	$580,800	$290,400	$58,080
Water sources	40	$12,000	$6,000	$1,200
Total Gates	186	$37,200	$18,600	$3,720
Total Acres	70,400	0	35,200	63,360
Total Cost		$10,034,500	$5,017,250	$1,003,450

Uncompahgre Field Office BLM (CO)		100% Participation	50% Participation	10% Participation
Total AUMs	44,882	$7,854,350	$3,927,175	$785,435
Total Allotments	144	0	72	130
Miles of Fence	753	$3,975,840	$1,987,920	$397,584
Water sources	80	$24,000	$12,000	$2,400
Total Gates	288	$57,600	$28,800	$5,760
Total Acres	482,096	0	241,048	433,886
Total Cost		$11,911,790	$5,955,895	$1,191,179

Moab Field Office BLM (UT)		100% Participation	50% Participation	10% Participation
Total AUMs	63,113	$11,044,775	$5,522,388	$1,104,478
Total Allotments	28	0	14	25
Miles of Fence	3,072	$16,220,160	$8,110,080	$1,622,016
Water sources	100	$30,000	$15,000	$3,000
Total Gates	56	$11,200	$5,600	$1,120
Total Acres	1,966,174	0	983,087	1,769,557
Total Cost		$27,306,135	$13,653,068	$2,730,614

Objectives & Findings

Objective 1: Provide and analyze sociodemographic data for landowners with public land grazing permits.

Sociodemographic and attitudinal data were obtained from mail surveys, and statistically analyzed. Permittees, as a whole, proved fairly homogenous in terms of reactions to policy, behavior, and attitudes regarding grazing issues. On the other hand, their demographic and ranching characteristics vary widely. This blending of diverse qualities with similar attitudes made it difficult to classify ranchers utilizing variables such as size of property, herd size, the agency controlling the permit, or geographical location. The resulting inability to easily categorize ranchers will make it difficult to target specific groups to receive information or education related to the buyout. However, the analytical techniques applied provided insights from both quantitative data from questionnaires, and more importantly the qualitative information attained from interviews.

We found no comprehensive data on permittees or their operations. As a result we sought to describe characteristics of the permittees and their operations. Such information helped us understand permittees' economic and social motivations and, subsequently, helped partially explain permittee reactions to various potential polices. We focused on the role that public land grazing permits played in respondents' ability to continue ranching and the propensity for consequential sale of associated private lands among different size classes of landowners. This factor is important in terms of long range planning, as concerns related to fragmentation of private land continues to increase across the West. Overall, those with larger land holdings, say that they will continue to manage

these lands predominantly as livestock operations. If their lands cannot be used efficiently in such a manner, the highest monetary value likely exists in real estate or development. Increased burdens, financial or regulatory, seem to have more effect on these individuals as related to their ability to continue ranching, perhaps because they are more dependent on their public land grazing permits to retain a viable ranching enterprise. The second analysis we conducted, evaluated differences in response between full-time and part-time ranchers based on the characteristics described above. For the most part, large landowners fell into the full-time rancher category and showed similar characteristics in response to policy changes, while part-time ranchers, on-average, owned smaller properties and were not as vulnerable to policy changes related to grazing permits.

These two analyses provided insight into trends in behavior, but were too broad for more detailed analysis. Ultimately, cluster analysis proved the only viable means to examine variability among permittees. Only by incorporating economic and sociological factors did it become possible for us to draw out differences among an otherwise homogenous group. Unfortunately, land management agencies do not have the information for such assessment readily accessible, and, therefore, would be unable to routinely delineate ranchers in this way.

Objective 2: Evaluate permittees' knowledge, likelihood of participation, and motivation for involvement in a grazing permit buyout program.

Permittees were also analyzed based on their willingness to sell their permits in a buyout program. The characteristics separating those willing to sell and those unwilling to sell were not immediately apparent. Items such as property size, length of tenure, and

income sources were not significant as reasons, while items such as age, education, and herd size produced significant differences. After these differences were revealed, the motivation for individuals being willing to sell still remained unclear. Consequently, the qualitative aspects of our research focused on understanding differences between these two groups.

Personal interviews were conducted after survey results were analyzed to gain greater insights into such factors as motivations and consequences of the proposed buyout. These interviews significantly expanded the information available from using mail-surveys alone. When dealing with an issue of such complexity, it is impossible to anticipate all potential consequences or outcomes. Therefore, interviews provided supplemental information from a sample of individuals who would be affected by the institution of such a policy, and who had better insight to the situation than unaffected individuals.

Public land ranchers are "splintered" in terms of sociological factors and behaviors related to land use. Overall, they hold similar beliefs about reasons to ranch, but they are participating in the public land grazing program for several reasons. This may make management increasingly difficult, trying to manage a changing population while simultaneously enforcing regulations with what may be increasingly negative consequences to some ranching operations. Generally, public land ranching as a way of life is in decline, and the continued pressure from pending retirements, droughts, escalating production costs, competition from both domestic and foreign markets will likely exacerbate the trend, and increasing attacks from environmentally concerned individuals and organizations (Torell et al. 2004). Public land ranchers will continue to

decline as a percentage of the population – particularly as demand for land increases with urban populations migrating to rural areas.

Several key issues relative to the proposed buyout beg further evaluation. First, the overall likely participation rate documented herein is not substantial (17%). There is palpable and pronounced "dislike" toward groups currently promoting the buyout program or simply a desire to continue ranching or both. Second, the proposed incentive ($175/AUM) is judged to be too low to attract a significant number of participants. The price would need to be doubled ($350/AUM) before willing participants would consider the buyout amount acceptable. Third, if such a buyout program were to become reality, the number of early adopters would likely be below 10% in the beginning, but negative social consequences would, consequently, compound on remaining permittees which could lead to more significant levels of participation over time. In the event that a significantly larger percentage did choose to participate, the problems resulting from a combination of potentially positive and negative ecological impacts, increased administrative costs, and detrimental effects to communities would be likely become quickly evident.

Objective 3: Describe possible trends and consequences of implementing the proposed grazing buyout program relative to agency impacts, ecological consequences, and outline costs of the program.

Ultimately, what we learned is not "groundbreaking news" in describing the population of public land ranchers. Numerous previous studies have revealed similar demographic descriptions (Bartlett et al. 1989, Birkenfeld 1994, Gentner 1999, Rowe 2000, Bartlett et al. 2002). But, our findings exposed previously unrevealed consequences

of an exodus of ranchers from the public land grazing program due to a successful permit buyout. Ripple effects associated with a successful buyout program could likewise materialize if herd numbers were significantly reduced by administrative authorization, or fees for grazing were significantly increased.

Prior to conducting interviews, we anticipated that numerous hidden costs - social, ecological, and economical - might arise as consequences of the proposed buyout. Interviews confirmed this suspicion and revealed other anticipated costs that seem likely to occur and had not been previously considered. For instance, the possibility of increased fragmentation and winter range loss for ungulate wildlife has been a long-standing concern relative to this proposed program. However, the potential loss of water sources had not been considered relative to impacts on wildlife. Administrative matters, such as fire management had also been previously raised, but no consideration has been given to issues and responsibilities related to fencing (construction and/or removal), managing remaining permittees on common allotments, removal and/or management of existing improvements (water, gates, cattle guards), problems related to management of inholdings and checkerboarded lands and impacts on states' ability to generate revenue from state lands, once surrounding federal lands management removes permitted grazing. Finally, cultural and social costs are typically considered secondary issues regarding this proposed policy, but personal interviews with permittees put these concerns in perspective - including monetary and social consequences for ranchers and the communities of which they are part.

The crux of our argument is that while operating at a financial loss relative to the return to the treasury, the overall cost of a buyout would be a substantially larger loss

economically. The total costs of purchasing AUMs and dealing with subsequent consequences would increase the amount of work on administering agencies, because associated "indirect" costs are not related solely to the reductions in individuals and associated grazing allotments, but are applied to the grazing program as a whole. Given the described indirect costs, and possible removal of grazing the majority of administering districts may no longer be in compliance with current land use plans. Amendments to extant land use plan may be needed for actions such as livestock removal, pulling fences, constructing fences, removing water sources, altering habitat for threatened or endangered species, and consequent preparation of environmental assessments (EA) or environmental impact statements (EIS).

Therefore, costs associated with the grazing problems and with the removal of grazing on some allotments would still be substantial – direct costs, coupled with the costs of purchasing AUMs from sellers. The superficial argument that a buyout program will save expenses related to administering the current grazing program would not be valid even with more than half the current permittees participating in the buyout. If an unexpectedly high participation resulted, say 70% participation, the direct buyout costs would exceed $2.1 billion, increase the agency workload to deal with consequences of such action – at least for some significant period, and still accrue increased indirect costs for the remaining permittees. Finally, previously proposed legislation which was used as a model for this study has numerous gaps, loopholes, and drawbacks that would create significant management problems for both agencies and ranchers. These problems could effectively negate or offset resulting ecological or financial benefits.

Conclusions and Recommendations

Advocates of the proposed buyout program have put forth two primary arguments for ending public land grazing through a buyout program. These arguments are: 1) public land grazing is detrimental to land health, and 2) the current federal grazing program operates at a financial loss. Those proposing the program claim that a buyout would provide a feasible "way out" of ranching for financially marginal operators or those who would like to retire from ranching. In addition, they propose that while the upfront cost of a buyout would be high, the overall cost to taxpayers would be recovered over time, as the grazing program would no longer operate at a loss.

Unfortunately, most such positive information about a buyout is conjectural. As there have been no formal studies made and no pertinent data produced. Such a state of affairs does not and should not inspire confidence in the advertised advantages of such a buyout and could produce results that are unexpectedly costly for administering agencies, less profitable than anticipated for potential participants, and potentially a legal quagmire. If a buyout program were to become reality, there are considerations and/or improvements that might benefit all parties involved.

1. Update Permittee List – This study, and others like it, have typically begun by collecting baseline data on permittees and their operations. If each ranger district or field office compiled detailed information relative to their permittees and their operations, it could be combined into a large database, it could aid immeasurably in research and in targeting specific groups. The current list provided by the agencies was surprisingly and sorely lacking in currency and accuracy including such problems as wrong addresses, duplicate names, and deceased individuals. In

its current form, the permittee list is not suitable for gathering information from or disseminating information to all permittees.

2. Analysis of District Offices – Although we identified potential indirect costs and analyzed data from five different administering offices, the data was based on estimates in some cases or simply could not be obtained from other regions. In order to more accurately predict costs, there would need to be a detailed accounting for each FS district or BLM field office, relative to such information as number of water sources, miles of fence, road maintenance, etc. Such databases are inconsistent in quality or not now readily available. Given GIS and remote sensing capabilities now available such a database could be accurately developed. Understandably, such a database could be accurately developed, but would require substantial increased resource staffing and agency funding.
3. Buyout Acceptance - Several improvements concerning the buyout program emerged. Due to the generally negative perceptions by permittees of proponents of the buyout program, costs potentially far in excess of expected amounts and previously unrecognized or revealed associated consequences, the proposed legislation should be revamped to accommodate these facts and likely consequences. If a buyout program were deemed appropriate by Congress in the future, it would be important to have interested parties in agreement and in support – specifically those most directly involved including agency personnel and the ranching community.
4. Redraft of Legislation – This study looked at buyout policy implications in order to help the agencies better evaluate such polices should they happen, there is no

current buyout policy. It seems that a buyout would garner little participation and support, and could produce some negative impacts to agencies, permittees, and communities. Some of the key points that should be addressed include: 1) permanent elimination of grazing for use by agencies; 2) lack of eligibility for participation by permittees in common allotments if all involved must participate; 3) consideration of management adjustments required to deal with inholdings and mixed ownership; 4) implications for state grazing lands; 5) tax issues for participants in a buyout; 6) tax consequences for permittees relative to ancillary expenditures on relative fencing, water sources, etc. on permits that are relinquished; and 7) legislation would need to reconcile the conflicts that such a retirement would cause with the multiple use and planning mandates of FLPMA. Retired areas would need to be exempted from these planning processes.

5. Trial Basis Program - It would be best and highly informational, to begin with a trial program in a specific region. This would allow unanticipated problems to emerge and provide better estimates of ancillary costs. These "test cases" should be established with advice from involved agencies in order to take advantage of insight from personnel, public opinions, and supporting elected officials at both state and federal levels.

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Appendix A: Land ownership size analysis.

Three acreage classes were derived (0 – 500, 500 – 2000, and > 2000) in order to describe different types of landowners as small, medium, and large. The justification for these divisions are the trends being seen in land fragmentation along these property lines (American Farmland Trust 2003, Wilkins et al. 2003). Mid-size farms and ranches are now more likely to be subdivided and sold for secondary homes or recreation. These three groups were analyzed regarding demographic characteristics, motivations for owning land, potential reactions to grazing buyout polices, reactions to increased fees and herd reductions, land sale characteristics, and environmental behaviors. An Analysis of Variance (ANOVA) test was used to test the significance between the three classes of landowners. A least significant difference (LSD) post-hoc test was performed on each variable that reached significance in the ANOVA test to determine which classes differed statistically from each other (Ott 1993).

There were significant differences between classes of landowners compared to number of animal units, length of tenure, percent income from ranching, off-ranch jobs, retirement, lease hunting, and other income (Table 4). As might be expected, total acreage increased the average number of AUMs increased, as did the number of years that the property had been owned. Likewise, the largest class of owners derived more income from ranching, than either the medium or small landowners. Conversely, income from off-ranch jobs and retirement were significantly higher for the smaller landowners compared to medium and large owners. Age, education, income, and other income sources all proved not to be significant, although income was slightly higher for larger landowners.

Table 4. Differences among acreage groups related to demographics, means and standard errors

Category Variable	Less than 500 ac	500 - 2000 ac	Greater than 2000 ac	F^a
N	195	207	275	
Acreage Owned (ac)	151.5 (9.6)	990.2 (27.4)	7562.6 (500.1)	1235.52
Range (ac)	10 - 478	501 - 1,995	2000 - 331,131	
Total AUM's	66.8 (6.31)	121.9 (10.3)	219.7 (18.8)	51.35***
Length of Tenure (years)	17.6 (1.3)	22.7 (1.7)	24.6 (1.63)	6.31***
Demographics				
Percent of Full-time Ranchers	36% (0.03)	55% (0.03)	70% (0.03)	32.28***
Percent Spouse with job	51% (0.04)	48% (0.04)	35% (0.03)	5.76**
Percent Income - Ranching	37.9% (2.2)	52.1% (2.4)	65% (2.1)	38.7***
Percent Income - Off - Ranch	27.4% (2.3)	23.7% (2.1)	13.8% (1.6)	13.43***
Percent Income - Retirement	14.7% (1.9)	8.5% (1.5)	3.7% (0.7)	16.74***
[a] *p<.05, **p<.01, ***p<.001				

Additionally, other analyses indicated several distinct differences among these groups when evaluating motivations for owning land, responses to the proposed buyout program, and land sale and conservation practices (Chart 5). Most notably, large and mid sized property owners were significantly more likely to sell their private property if they sold their permit in a buyout. Accordingly, when respondents were asked the reverse of this question (I will never sell my private property), smaller owners agreed significantly more that they would not sell their property. This was confirmed by demographic characteristics that assesses responded land sale and conservation practices, which showed increased land sale trends among mid size, and to a lesser degree large owners (Chart 6). Responses to increased fees and reduced herd numbers were analyzed in a similar manner as before, with significant differences only occurring with $8 and $10 increases (Chart 7 & 8).

Chart 5. Reasons for owning land and reactions to buyout program related to size of ownership

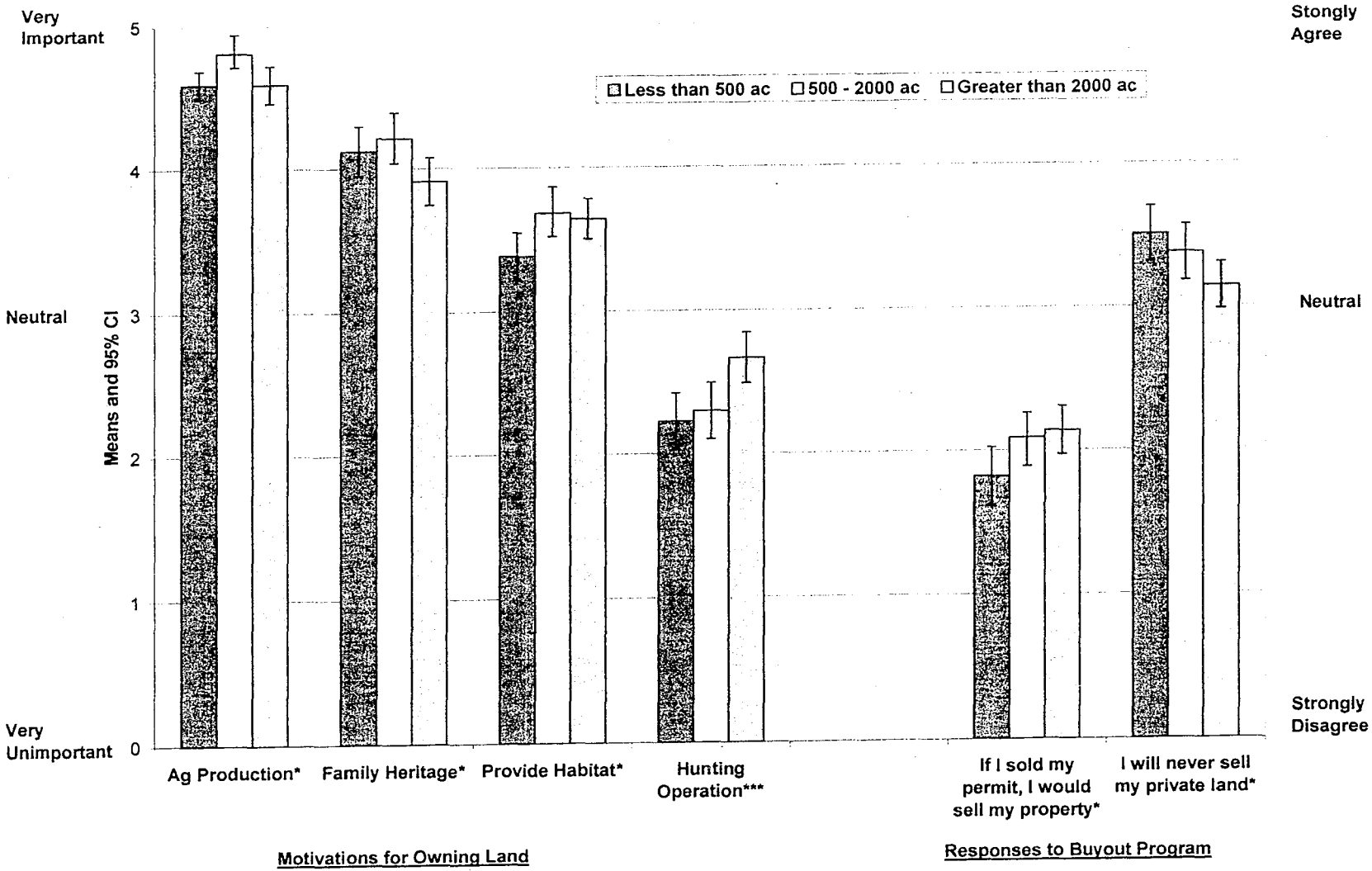


Chart 6. Land sale and conservation behaviors related to size of ownership

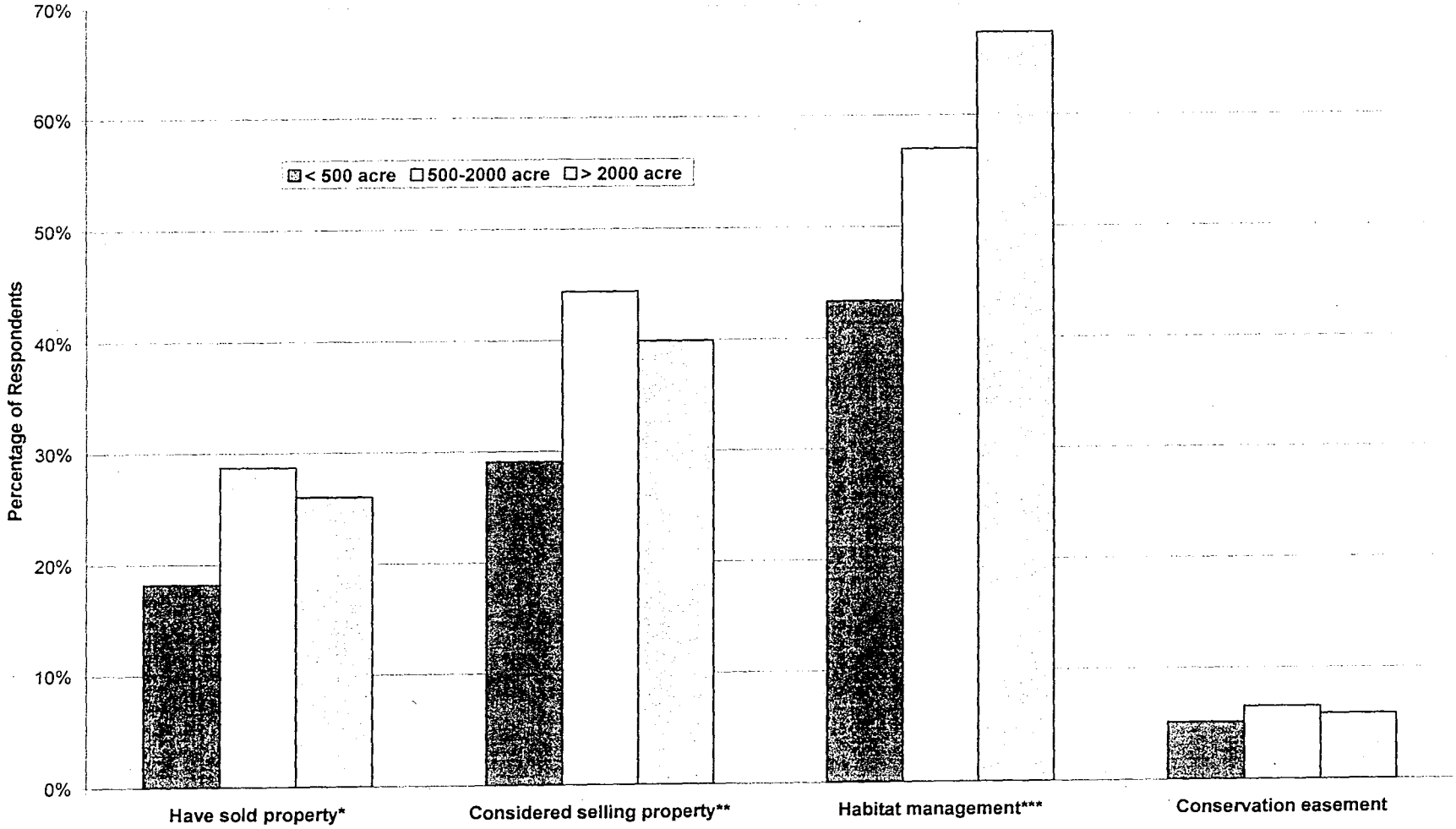


Chart 7. Reactions to fee increases related to size of ownership

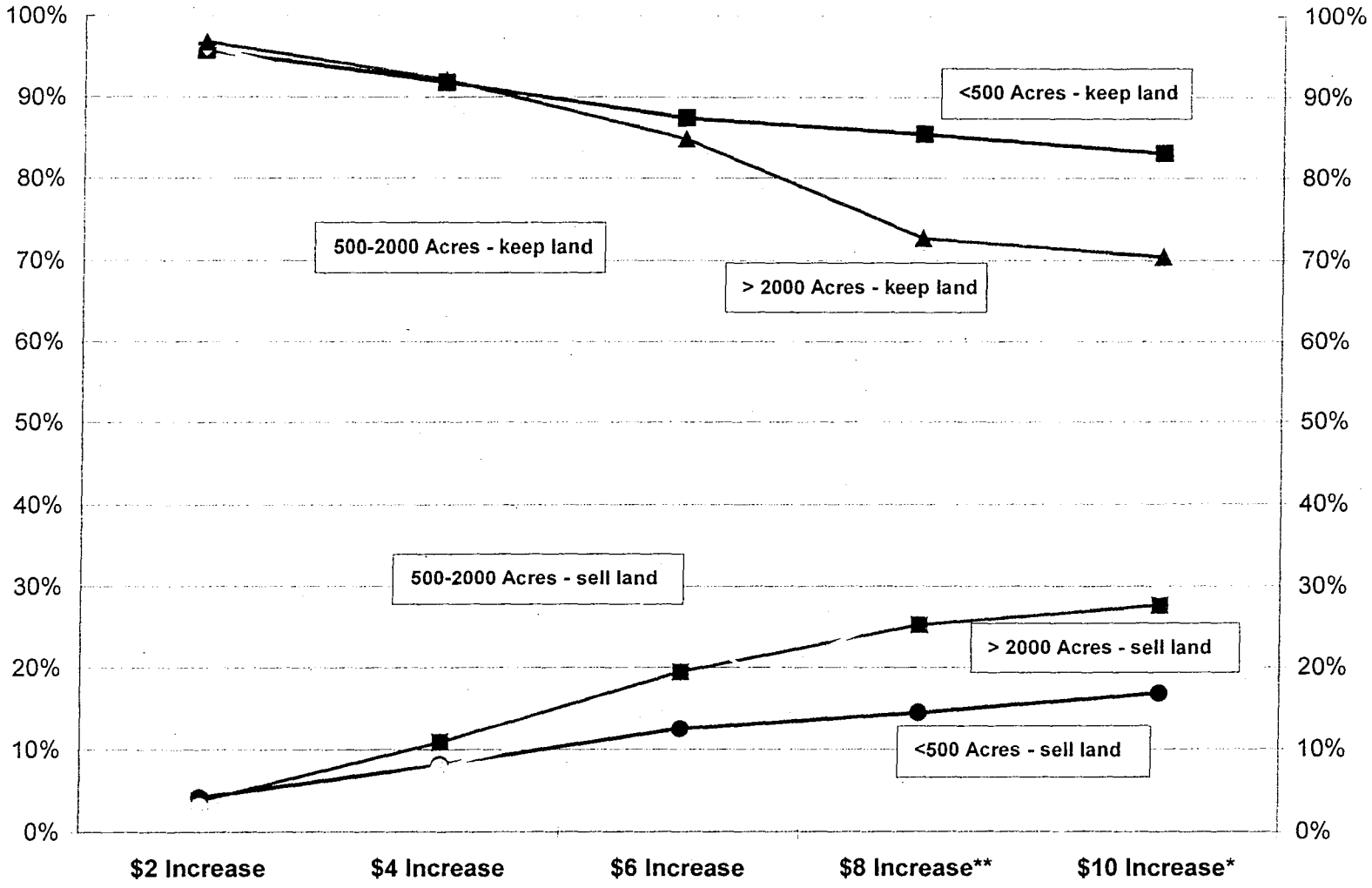
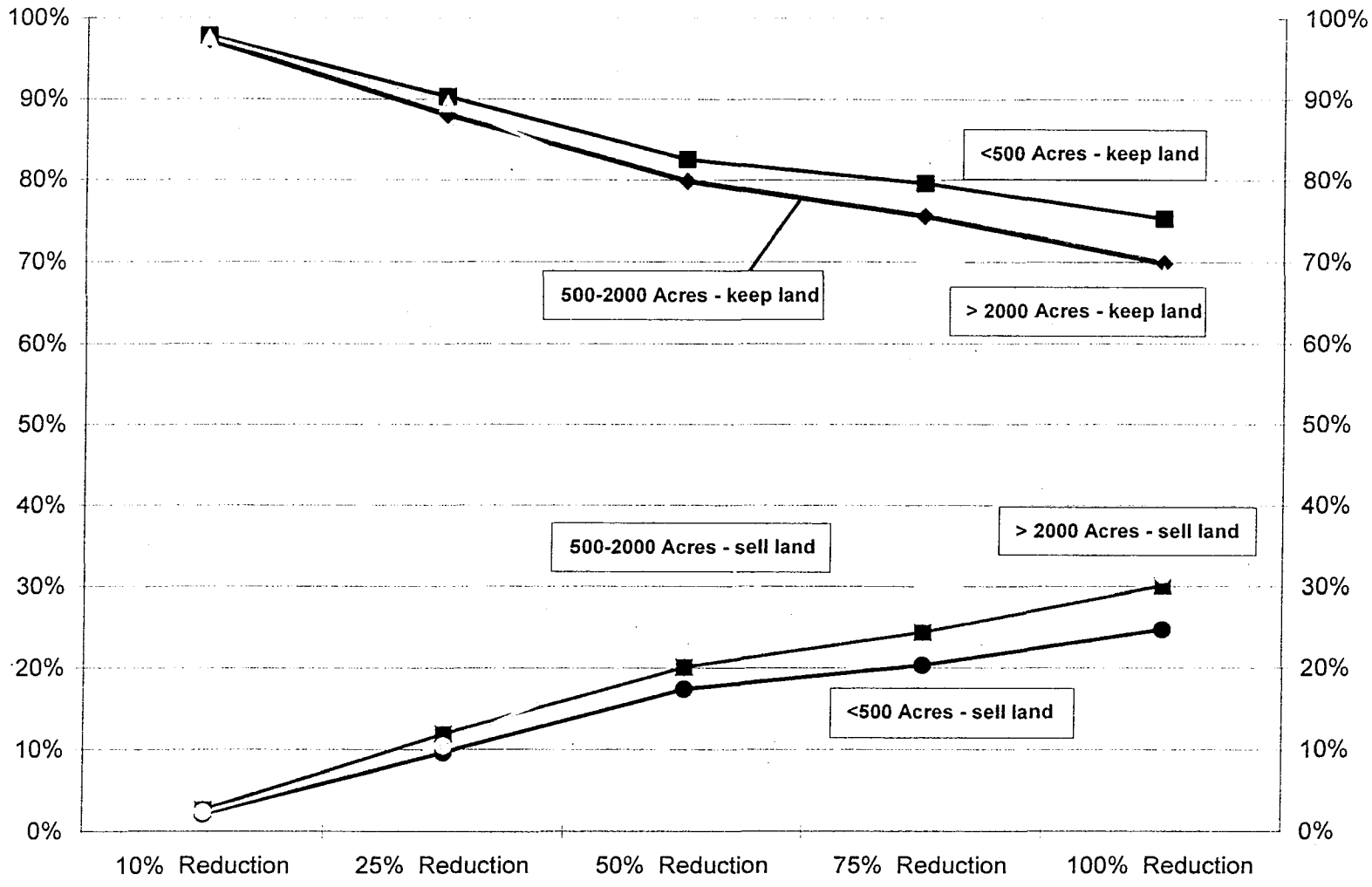


Chart 8. Reactions to herd decreases related to size of ownership



Appendix B: Full-time versus part-time rancher analysis.

In order to provide a more accurate view of individuals who subsist on ranching, an analysis was conducted comparing full-time and part-time ranchers. Once again an ANOVA was used, which revealed significant differences between types of ranchers compared to total acreage, number of animal units, length of tenure, education, total income, percent income from ranching, off-ranch jobs, retirement, investment, dude ranch income, and other sources (Table 5). As would be expected, full-time ranchers had more total acreage, higher numbers of AUMs, and had owned land longer than part-time ranchers. Education was significantly higher for part-time ranchers, although the mean was in the (3) category for both, which is some college or vocational school. Total income was higher for the part-time group, with their mean being approximately $58,000, while full-time ranchers average approximately $40,500. In addition, the full-time group derived more income from ranching. However, part-timers were more divided on income sources and derived significantly more income from off-ranch jobs, retirement, investment, and dude ranch, than the full-time group.

When these two groups were evaluated for land ownership motivations and reactions to the buyout program similar results were seen as in the land size analysis, mainly because large and mid size owners were full-time ranchers, versus small owners who were part-time ranchers. Again there are similar motivational differences among these two groups for owning land, primarily agriculture production and family heritage. The buyout questions produced additional differences than the land classes did, in particular part-timers indicated a more positive overall opinion of the program than their counterparts (Chart 9). Regarding land sale and conservation behaviors similar patterns

can be seen as before, with full-timers having sold more land and being more likely to do so, as well as participating in conservation management (Chart 10).

When the influence of fee increases and herd reductions were analyzed for this group, there were several notable differences. There was a significant difference between these two groups at the $8 and $10 fee increase, and 25% - 100% reduction level (Charts 11 & 12).

Table 5. Differences among part-time and full-time ranchers related to demographics, means and standard errors

Category Variable	Part-time Rancher	Full-time Rancher	F^a
N	318	386	
Acreage Owned (ac)	708 (1.1)	2,188 (1.1)	69.82***
Range (ac)	10 - 147,910	20 - 331,131	
Total AUM's	74 (1.1)	191 (1.1)	89.30***
Length of Tenure (years)	18 (1.1)	25 (1.1)	17.18***
Demographics			
Education	3.53 (0.1)	3.06 (0.1)	32.36***
Income	$58,000 (0.1)	$40,500 (0.1)	26.58***
Percent Income - Ranching	18.5% (2.1)	80.8% (0.1)	2056.84***
Percent Income - Off - Ranch	36.3% (2.1)	8.4% (0.1)	176.29***
Percent Income - Retirement	14.9% (1.6)	3.3% (0.4)	54.29***
Percent Income - Investment	8.6% (1.2)	2.5% (0.4)	27.95***
Percent Income - Dude Ranch	1.03% (0.5)	0.13% (0.1)	4.78*
[a] *p<.05, **p<.01, ***p<.001			

Chart 9. Reasons for owning land and reactions to buyout programs related to part-time vs. full-time ranchers

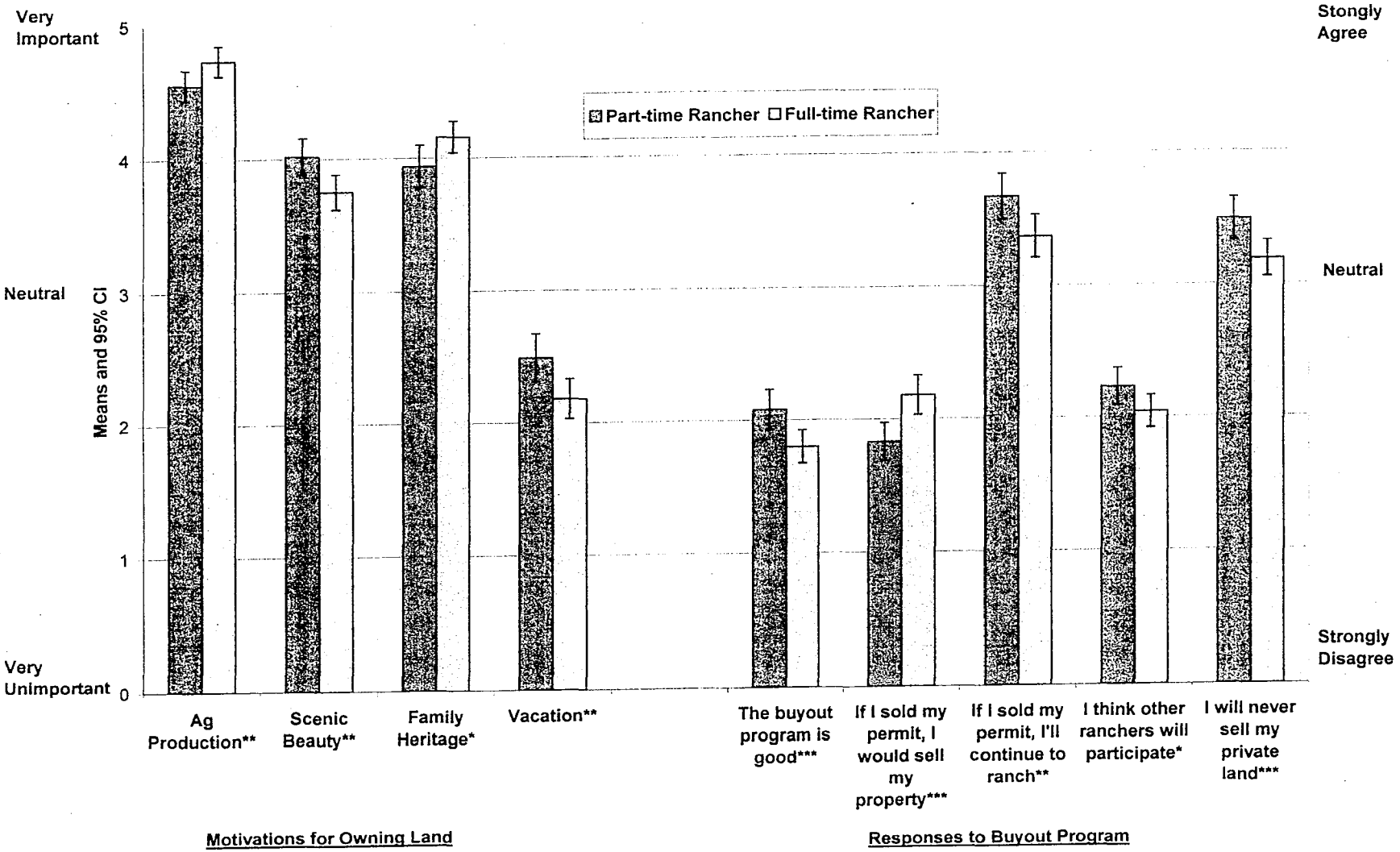


Chart 10. Land sale and conservation behaviors related to part-time vs. full-time ranchers

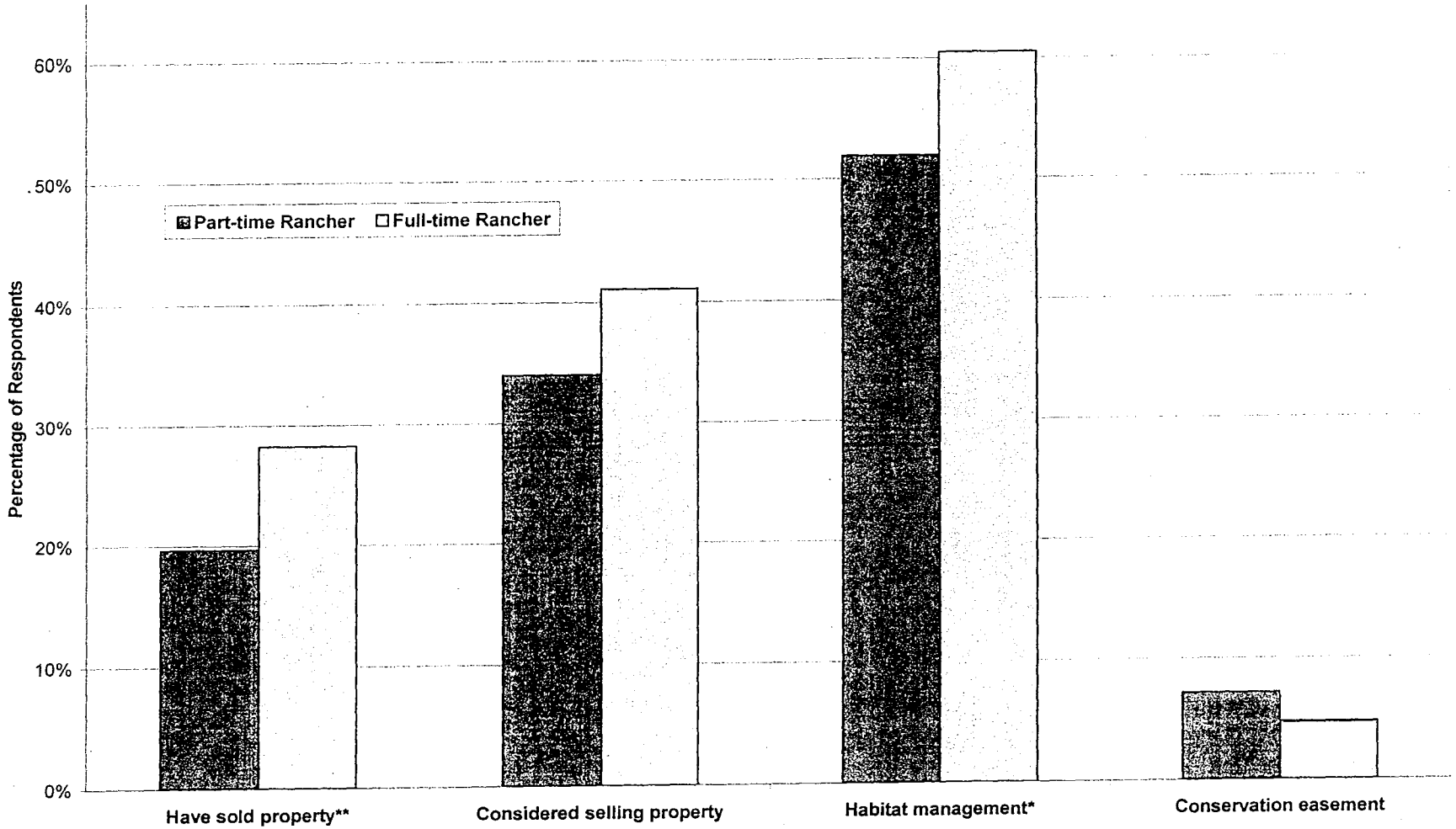


Chart 11. Reactions to increased fees related to part-time vs. full-time ranchers

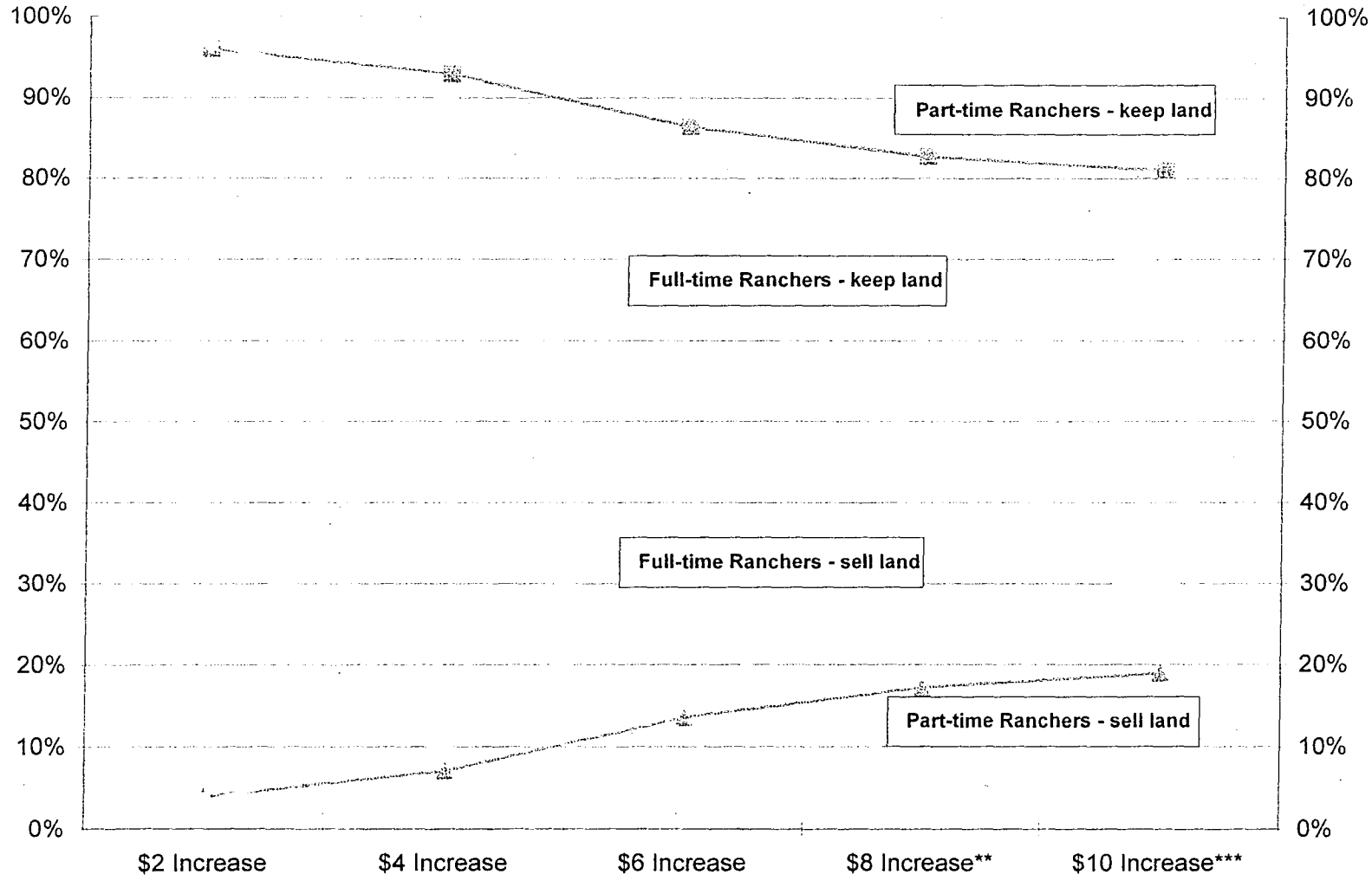


Chart 12. Reactions to herd reductions related to part-time vs. full-time ranchers